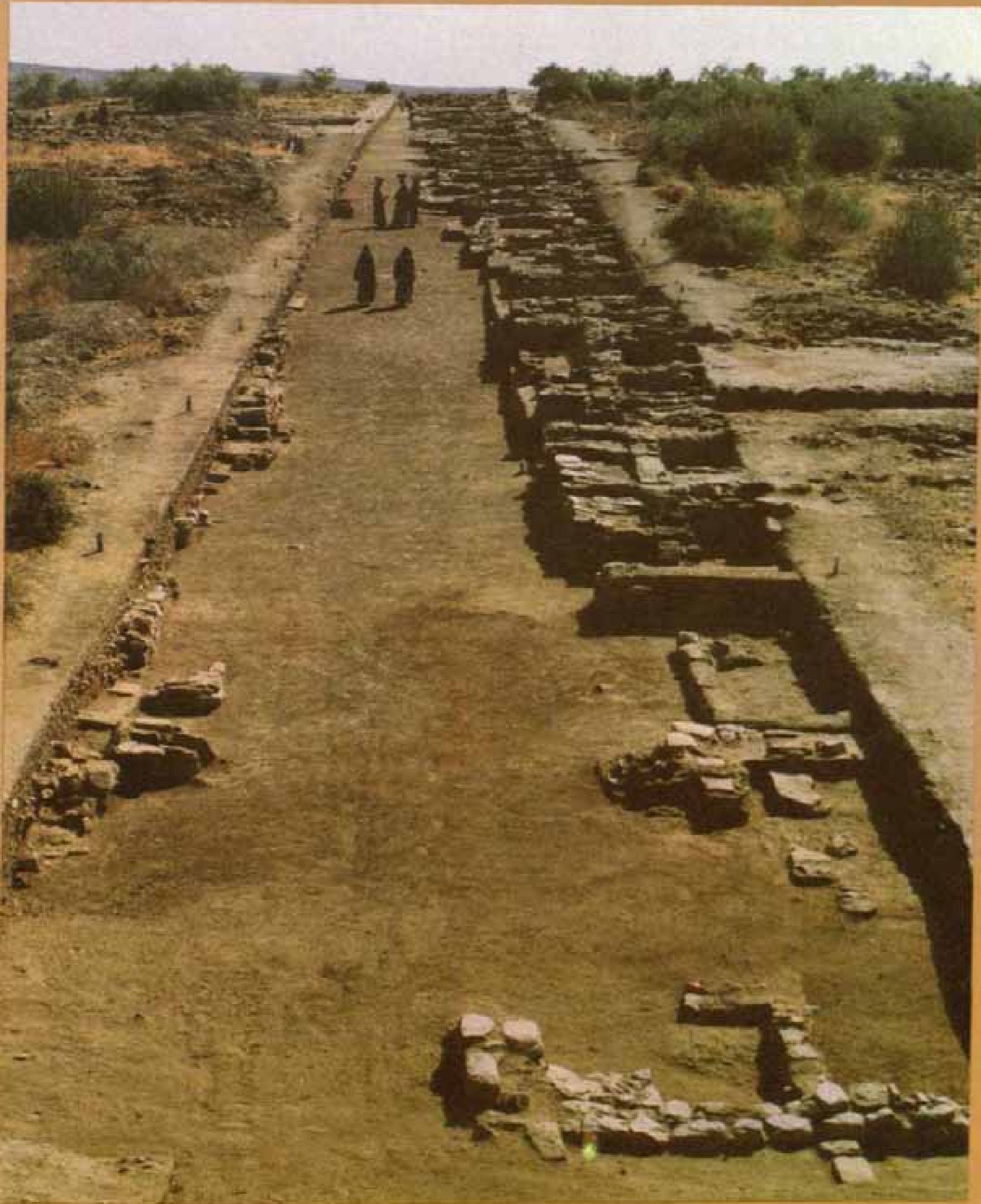
Indian Archaeology

1992-93—A REVIEW



INDIAN ARCHAEOLOGY 1992-93 — A REVIEW

EDITED BY
AJAI SHANKAR

Director General
Archaeological Survey of India



PUBLISHED BY THE DIRECTOR GENERAL
ARCHAEOLOGICAL SURVEY OF INDIA
GOVERNMENT OF INDIA
JANPATH, NEW DELHI
1997

Front cover : Dholavira : Main street in Middle Town
Back cover : Dholavira : A cache of Late Harappan valuables

Price : Rs. 315.00

PRINTED AT M/S BENGAL OFFSET WORKS, 335, KHAJOOR ROAD, NEW DELHI - 110005

PREFACE

I am happy to place before the scholars and readers, *Indian Archaeology 1992-93 — A Review*. The publication of the *Review* has been somewhat in arrears. With the coming out of this issue, the gap has been reduced further. Efforts are being made to clear the arrears by the end of the next financial year. The main reason for the delay in bringing out the issues is the late receipt of material from various contributors. If the contributors send us the matter well in time, it would be possible for us to bring out the *Review* regularly. I request the contributors particularly my colleagues in the Survey, Departments of Archaeology and Museums: Museums: Universities and other research institutions to send us the material immediately after the closing of the current financial year, keeping in view the style and format of the previous *Reviews.* This would help in clearing the backlog of this publication.

The information contained in this issue covers the multifarious range of activities in different fields of archaeology in India, including reports on epigraphical discoveries, development of museums, radiocarbon dates, architectural survey of secular and religious buildings, structural conservation and chemical preservation of centrally protected monuments and sites and museum objects, etc. Out of several excavations carried out in the country during the period under review. I may specially mention here the important ones undertaken by the Survey at Shri Shri Suryapahar, District Goalpara in Assam; Kolhua, District Muzaffarpur in Bihar ; Lalkot in Delhi: St. Augustine Church in Goa; Dat Nagar, District Shimla in Himachal Pradesh; Hampi, District Bellary in Karnataka; Bhawar and Kachargarh, District Bhandara and Pachkheri. District Nagpur in Maharashtra; Pynthorlangtein, District Jaintia Hills in Meghalaya; Barabati Fort, District Cuttack in Orissa; Sravasti, District Bahraich and Sarnath, District Varanasi in Uttar Pradesh. State Departments of Archaeology and museums and other research institutions also carried out excavations at Garapadu, District Guntur, Gopalapatnam and Thotlakonda, District Vishakhapatnam and Nela Kondapally, District Khammam in Andhra Pradesh; Maner. District Patna in Bihar: Moti Pipli, District Banaskantha and Rojdi, District Rajkot in Gujarat; Balu. District Kaithal in Haryana: Talkad, District Mysore in Karnataka: Bhagimahari, District Nagpur in Maharashtra: and Jainal Naula, District Almora and Imlidih Khurd, District Gorakhpur in Uttar Pradesh.

The Survey continued to carry out major works of structural conservation and chemical preservation at Angkor Vat in Cambodia under a bilateral agreement.

I take the responsibility for omissions, if any. and other inaccuracy, which may have crept in sorting out, compiling and editing the material for this issue. However, the responsibility for the information published in the *Review* is that of the contributors.

I am also deeply obliged to those colleagues of mine particularly Mr. B.M. Pande, then Director (Publications), Mr. C. Dorje, Superintending Archaeologist and Dr. (Kr.) Arundhati Banerji, Deputy Superintending Archaeologist and other ministerial staff in the Publication Section who have helped me in the preparation of the text and plates for the press within a short time.

AJAI SHANKAR
Director General

19 March, 1997

CONTENTS

INDIAN ARCHAEOLOGY 1992-93 — A REVIEW

I. EXPLORATIONS AND EXCAVATIONS

ANDHRA PRADESH

1. EXPLORATION IN DISTRICT ADILABAD.— The Prehistory Branch of the Archaeological Survey of India[1] under the direction of L.S. Rao, assisted by N.K. Nimje, P.S. Pashine, P.C. Dogra and T.B. Thapa, discovered a sprawling Middle Palaeolithic site near Kishtapur village. The site is located on the right side of the Nagpur-Hyderabad National Highway (near 274 km stone from Nagpur). The area is surrounded by a low lying Deccan trap hill range with black soil. The tools are mostly made on silicious material like chalcedony, chert and quartz. The tool assemblage comprises scrapers of varying size and types, points, borers, discoids, etc.

2. EXCAVATION AT GARAPADU, DISTRICT GUNTUR.— The Birla Archaeological and Cultural Research Institute (BACRI) conducted excavations at Garapadu (80° 12' ; 16° 30'), in collaboration with Nagarjuna University under the direction of G.Kamalakar (BACRI) and B.R. Subramanyam (Nagarjuna University) assisted by M. Veerender, Venushankar, Satyapal Reddy, Ramakrishna, Narasareddy, Satyanand Kumar and G. Maheshwari.

Garapadu, a populous village in Eddakurapadu Mandal of Guntur situated 15 km north of Sattenapalli town where a low but extensive mound, spread over 70,000 sq m composed of ashy grey occupation soil was located some 2 km to the north-west of the village. A shallow wet weather stream originating in the hills on the distant south, skirts the mound on the west and the north. Garapadu is in the fertile corridor bordered by low hills on the south and the river Krishna on the north.

The surface collection from the disturbed and undisturbed areas of the mound yielded sherds of neolithic, megalithic and the early historic periods. The antiquities of neolithic period comprise axes, celts, steatite beads, microlithic blades and hand-made pottery. The megalithic period is marked by the presence of various types of stone beads including jasper, quartz, carnelian, amethyst and Black-and-Red ware pottery. From the early historical level were collected red ware, black-slipped ware, tanned ware, apart from beads, bangle pieces of shell and glass; terracotta objects and coins. The occurrence of two lead uninscribed lion type coins of Sadas from surface also indicate the possibility of Sada rule in the region.

---

[1]The Archaeological Survey of India is referred to in the following pages as the 'Survey' only.

3. EXCAVATIONS AT NELAKONDAPALLY, DISTRICT KHAMMAM.— The Department of Archaeology and Museums, Government of Andhra Pradesh carried out excavations at Nelakondapally and brought to light a complete view of the Mahastupa and a portion of monastic complex. Two wings of vihara, each with fifteen cells were exposed. Each cell measures 2.50 X 2.15 m. The monastic complex appears to be of *chatussala* pattern. Excavations at Garlagadda mound, yielded different sizes of brick alignments and lime stone pieces. Other antiquities from the site include, a large number of copper and lead coins belonging to Ikshvaku and Vishnukundin dynasties respectively besides, beads, terracotta figurines, conches and bangles.

4. EXPLORATION IN DISTRICT KURNOOL.— Ismail Kellellu of the Department of Ancient Indian History, Culture and Archaeology, Nagpur University, in the course of his explorations in Yemmiganur tehsil, has brought to light an extensive protohistoric and early historical site at Nandavaram (15° 51'; 77° 29'), the Headquarters of the Mandalam of that name, and about 70 km west of Kurnool town.

The site is located in the cultivated fields adjoining a dried up irrigation which has since been converted into a habitation settlement. The archaeological remains such as ash, charcoal, bones, pottery, beads made on terracotta, steatite, shell and semiprecious stones and a neolithic celt are found lying scattered in an area of about 5 hectares. From the occurrence of slipped and unslipped varieties of red ware, black ware, Black-and-Red ware and other antiquities, the site appears to have been occupied by the people during the protohistoric and the early historical times. Inscriptions of the Rashtrakutas and the later (Kalyani) Chalukyas mention this village as belonging to the administrative division of Sindavadi - 1000 which was a part of Nolambavadi - 32000. Two stone inscriptions, one each from Parvata Mallikarjuna temple and Koti Ramalinga temple were also reported earlier. The better preserved one, from Parvata Mallikarjuna temple records the construction of the temple and a grant made by the builder for daily worship of the deity. The inscription is in the Saka era (AD 1189).

A number of loose sculptures, made on green schist stone representing Vishnu, Ganesa and *Sapta-matrikas* were also located in the village.

Ismail Kellellu further discovered in the same tehsil an ashmound in association with a habitation site at a small village called Tsalla Kudlur (locally known as Kulur) (15° 49'; 77° 33') about 9 km east-north-east of the tehsil Headquarters on the Yemmiganur - Kurnool (via Belagallu) road. A small seasonal *nala* called Soganur *vanka* divides the present day village into two locally known as Pata Kuluru and Kotta Kuluru meaning respectively old and new Kuluru on the north-west and south-east of the *nala.* The whole village is now surrounded by agricultural fields some of which are being irrigated by step-wells. The main crops are paddy, groundnut, sunflower (irrigated variety) and *jowar, korra, bajra* and pulses (dry variety).

About 600 m north of old Kuluru and on the west bank of the *nala* an extensive low mound (4 to 5 m high) covering an area of about 10 hectares was noticed. Pottery, iron slag, animal bones, broken pieces of stone objects collected here suggest the existence of a flourishing township during the early historical times. Adjacent to the habitation mound, a different cloddy and scoriacious type of grey soil was noticed in an area of about 250 sq m which on close observation appeared to be an ashmound.

Chemical examination of soil also confirmed that the grey hard soil is actually the ash of burnt cowdung and significantly this site is perhaps the only ashmound site with habitation deposit reported in this region. The other two ashmounds, *viz.,* Gudekallu and Suguru in this tehsil noticed earlier by Robert Bruce Foote were without any habitation deposit near by. Besides grey ware, dull red ware, red ware, black ware, Russet-coated painted ware and Black-and-Red ware, a fragment each of a ring stone and a neolithic celt were collected in addition to the shell bangles, terracotta beads and iron objects.

5. EXPLORATION IN DISTRICT MAHBOOBNAGAR.—J. Vara Prasad Rao of the Hyderabad Circle of the Survey, in the course of village-to-village survey discovered the following sites of archaeological interest.

Taluk	*Village/Site*	*Nature of remains*
Makthal	Chegunta Gothi	*Sad* -stones of medieval period; loose sculptures of Kakatiya and Vijayanagara periods
	Gudeballur	Middle palaeolithic and microlithic tools
	Gurajala	Middle palaeolithic and microlithic tools
	Hindupur	Middle palaeolithic and microlithic tools
	Kalhalli	Middle palaeolithic tools
	Krishna	Middle palaeolithic and microlithic tools
	Kusumurthy	Middle palaeolithic tools
	Madhavaram	Megalithic site represented by cairn circle
	Madmal	Middle palaeolithic, microlithic tools and menhirs
	Muraharidoddi	Middle palaeolithic, microlithic tools and menhirs
	Phasalapad	Loose sculptures of medieval period
	Shukralingampalle	Middle palaeolithic tools

6. EXCAVATION AT GOPALAPATNAM, DISTRICT VISHAKHAPATNAM.— Excavations undertaken by the Department of Archaeology and Museums, Government of Andhra Pradesh at the habitation site revealed five layers of occupation representing two cultural periods, *viz.,* Period-I (Satavahana) and Period-II (post-Satavahana). Excavations at Veeralametta also brought to light a terraced brick platform having the lower and upper *pradakshinapathas.* Antiquities recovered from the site include sherds of black and red ware, polished black ware, red ware, Rouletted ware, knobbed ware, beads and bangles.

7. EXCAVATION AT THOTLAKONDA, DISTRICT VISHAKHAPATNAM.— Excavations conducted by the Department of Archaeology and Museums, Government of Andhra Pradesh at the Buddhist settlement over the hill top, brought to light remains of a circular brick platform to the south-west of Vihara-V, a rectangular hall (9.65 X 4.10 cm) behind Vihara-VI and also a series of burials at a place locally known

as Neralachandunu. The discovery of small fragments of red ware urn inside the pit indicate the practice of depositing ashes of the deceased. The ceramic industry mainly consists of black and red ware, black ware, red ware, etc.

ARUNACHAL PRADESH

8. EXPLORATION AT MAYO HILL, DISTRICT DIBANG VALLEY.— Extensive archaeological explo rations were undertaken in and around Roing in district by the Directorate of Archaeology, Government of Arunachal Pradesh.

The exploration mainly concentrated at Mayo hill, situated 12 km north of Roing yielded a brick mound exposed upto the plinth level. The site (tenth-twelfth century AD) is approximately 3 km up stream from Rukmininagar (Nati) and is of 560 metres A.S.L.

The brick mound considerably disturbed, measured 29 X 25 m and is rectangular on plan. A large number of scattered bricks and brickbats were noticed on the surface. The bricks are of various sizes and shapes and the largest and the smallest brick sizes are 20 X 16 X 4 cm and 12 x 8 x 3 cm respectively. Fom the preliminary survey it is presumed that the mound was probably used as watch tower.

ASSAM

9. EXPLORATION IN DISTRICT DHUBRI.— The Prehistory Branch of the Survey under the direction of L.S. Rao, assisted by N. Taher, R.K. Dwivedi, C.I. Yadav, Ghayasuddin, P.C. Dogra and P.D. Satte in the course of their exploration located a historical mound at village Bangtimari (25° 45'; 89° 53') which lies about 7 km south of village Hallidayganj on Phulbari-Tura road. This site yielded sherds of coarse red ware.

10. EXCAVATION AT SHRI SHRI SURYAPAHAR, DISTRICT GOALPARA.— D. Bhengra, assisted by T.J. Baidya, S.K. Choudhary, P.M. Das, B. Sinha and T.K. Srivastava of Guwahati Circle of the Survey conducted a small scale horizontal excavation at Shri Shri Suryapahar with a view to co-relate the rock-cut sculptures with the votive stupas in the area.

Ten quadrants (4.25 X 4.25 m) were excavated which revealed four phases of brick structures belonging to two periods, *viz.,* sixth-seventh century and eighth-ninth century AD respectively. Early period comprises three phases of brick structure alongwith *surkhi* rammed floor, brick platform, big and small walls, pathways, partition walls and staircases. The size of the bricks varies from 22 X 24 X 6 cm to 34 X 16 X 6 cm, 21 X 10 X 6 cm, 2 1 X 6 and 42 X 22 X 6 cm. Among the antiquities mention may be made of terracotta plaque depicting a bust of an *apsara* of sixth-seventh century AD, decorated terracotta fish and lion, moulded tiles with mythological scenes and large quantity of carved and moulded tiles bearing full and half lotus medallion and decorative motifs. Pottery from this period include button-knobbed lid, incurved bowls, knobbed-lids, basin, spinkler, *chilam, diya* and miniature vases of dull red in colour, coarse to medium in fabric.

Late period is characterized by long walls, brick platform, *surkhi* rammed floor in irregular pattern. Bricks of earlier period were re-used alongwith the ill-fired bricks. The structure of the late period is very much disturbed. Among the important findings of this period mention may be made of

terracotta torso, broken part of *pranala* of a *yonipitha,* small grinder (red stone), mutilated terracotta plaques, carved bricks and tiles besides basin, knobbed-lid, *chilam* and jar.

BIHAR

11. EXPLORATION IN DISTRICTS BHAGALPUR AND SARAN.— Under the village-to-village survey scheme, K.P. Choudhary and K.C. Srivastava of Patna Circle of the Survey carried out exploration work in districts Bhagalpur and Saran respectively. The details are as under.

District	*Village*	*Nature of remains*
Bhagalpur	Barahat	A temple with images of Siva-Parvati, Surya, Vishnu, Ganesa and Hanuman, etc.
—do—	Sabalpur	Ancient temple
—do— *Thakurbari*	Tilkar	Remains of ancient temple
Saran	Dhangarha	Ancient mound with beads, potsherds and images

12. EXPLORATION IN DISTRICT HAZARIBAGH.— S.S. Gupta, assisted by N.K. Nimje of Prehistory Branch of the Survey located a Megalithic site at Bhagwantanr (23° 44'; 85° 3') where a number of menhirs have been noticed. These menhirs vary in size from 0.25 m to 1.5 m in length and 0-2 m to 1 m in width oriented in north-south direction. In southwestern region of the district in Damadar valley, clusters of menhirs have also been located at Phatha (24° 55'; 85° 19'), Pakri Barwadih (23° 52'; 85° 13'), Benti and Kahargardi Tola (23° 52'; 85° 13'), Mandar (23° 47'; 85° 2'). These menhirs are oriented north-south with their top ends mostly either rectangular, angular or semi-circular in shape. In some cases, dressed stones have been paved around the menhirs, forming a sort of floor all around.

Apart from these, two painted rock-shelters were noticed in the hills of Satpahari, 5 km west of Mandar. Paintings were both in monochrome and bichrome, depicting geometric designs and animal figures in deep red and white colours. Middle stone age artefacts comprising points, scrapers and flakes on sandstone and quartzite are found at Phatha near the menhirs at Chutaba (24° 54'; 85° 15').

Painted rock shelters at Isco (23° 48° ; 85° 20') nearly 7 km south-east of Badom in district Hazaribagh were also reinvestigated. At Isco, painted panels comprise mostly geometric patterns like squares, concentric circles, cross and bull along with deer, bull and symbolic representations of human figure. Most of the paintings are executed on deep red with outlines in white or yellow.

Early and Middle stone age tools shaped out of sandstone and quartzite were also picked up from floor of some of the rock shelters. Most of the artefacts have two or three flakes detached with cortex at the butt end.

13. EXCAVATION AT KOLHUA, DISTRICT MUZAFFARPUR.—In continuation of last year's work *(Indian Archaeology 1991-92 —A Review*[1], pp.5-6), Excavation Branch III of the Survey under the general supervision of Lai Chand Singh, assisted by B. Nath, D.K. Ambastha, Vijay Shankar, P.C. Das, S.P. Gupta, Y.S. Nayal and Y.D. Sharma resumed excavation at Kolhua.

[1] This publication will hereafter be referred to by the year only.

The Kushana brick-lined tank noticed in last year's excavation was fully exposed measuring approximately 32-5 meters east-west and 31-5 meters north-south. The length and width of the tank was fully exposed barring western outer wall of southwestern end. The northern and southern walls of the tank have got 'Z' shape projection.

The maximum depth of the tank exposed so far measures 4-30 meters. Further digging of the tank could not be possible due to profuse influx of sub-soil water. Entire tank was fashioned in tier-system with altogether seven tiers so far exposed in the northwestern corner. Major portion of tiers constructed in brick-masonry was in the usual header and stretcher style (pl. I).

The northern wall of the projected western half of the tank was fashioned in regular off-set system at every alternate course. The off-sets, varied from 8 cm to 20 cm, upto the depth of three tiers when counted from top. Also noticed were the two bathing *ghats,* a corbelled arch, *pucca* drain, running from north-east.

14. EXCAVATION AT MANER, DISTRICT PATNA.— The Department of Ancient Indian History and Archaeology, Patna University, in continuation of previous work *(1991-92,* pp. 6-7) resumed excavation at Maner under the direction of A.K. Singh, B.P. Roy, with the assistance of J.P. Singh, N.K. Arya and P.K. Bose.

Two trenches, each measuring 6 m x 4 m were laid out near the eastern edge of the southern mound overlooking the old bed of river Sone with a view to confirm the cultural sequence of the site.

Excavation in this area revealed two cultural periods as against the four-fold sequence noticed earlier. Of the two periods, Period I is represented by Northern Black Polished Ware (NBP) deposit with a maximum thickness of 1-20 m. It rests over the natural soil and characterized by a compact deposit of yellowish red soil. Remains of burnt brick wall found at a depth of 4-50 m in north-south direction, measured 1.13 X 0.50 m. The wall consists of four courses of bricks (0-43 x 0-25 x 0-6 m). Two examples of cast copper coins of Sunga affinity were found in the vicinity of the wall. One of the two coins is square showing a tree in the obverse, while the reverse contains symbol depicting three arches and a crescent on top *(chandrameru).* The second one also square, has on its obverse a figure of tiger or lion and on the reverse there is a moving elephant. Other antiquities of the period include terracotta sealing, animal figurine, skin rubber; stone weight, iron implements; terracotta and stone beads. The other associated wares comprise of black-slipped, grey, black-and-red and red ware.

Period II is marked by the appearance of Gupta and late Gupta antiquities along with the remains of burnt brick structures. A wall running in north-south direction found at a depth of 4.05 m, consists of six courses of bricks (1.95 m X 0.65 m). The antiquities belonging to this period include terracotta animal figurines, female head, conical objects, trunk portion possibly of an elephant made of bone, iron objects, terracotta and stone beads. The excavation also yielded sherds of polished and plain red ware apart from a sprinkler in red ware. From the topmost layer were recovered mixed materials including sherds of green glazed ware of medieval period.

DELHI

15. EXCAVATION AT LAI, KOT AND ANANGTAL, DISTRICT SOUTH NEW DELHI.— In continuation of last season's work *(1991-92,* pp.9-15), Delhi Circle of the Survey, under the direction of B.R. Mani assisted

by Urmila Sant, A.K. Khanna, Vishnu Kant, A.C. Chakravarti, M.K. Batra, D.K. Bhardwaj, S.K. Dikshit, R.B. Chhetri, R.K. Sachdeva, G. Nageshwar Rao, Jagdish Chander, Suresh Chand Sankhyan, Suresh Choudhary, Sunil Kumar, Devi Charan Sharma, Indronil Roy, Rajani Shankar, Sanjay Kumar and H.S. Meyan and Ram Kumar of Headquarter's office resumed excavations at the citadel mound at Lai Kot and adjoining Anang Tal reservoir.

The cultural deposits at the site have been assigned to two periods, *viz.,* Period I: Rajput period (middle of eleventh century to the end of twelfth century) and Period II: early Sultanate period (end of twelfth century to the middle of fourteenth century). No evidence of post-Tughlaq phases was found at the citadel mound. Period II has further been divided into four structural phases- the two earliest representing palatial structures and the last two comprise *interior* and ordinary house complexes of late Khalji and Tughlaq periods. This confirms the fact that intially the Turks had settled at Lai Kot and shifted their capital in AD 1303 to Siri, the second city of Delhi after which the citadel of Lai Kot was gradually occupied by common folk and was finally abandoned in Tughlaq period. With a view to collect more archaeological information regarding the distinguishing cultural traits and material culture of the Rajput and the early phase of Sultanate periods, the site was taken up for excavation.

The main objective of this season's work was to study the layout and settlement pattern of the palaces and other allied structures of the citadel; to confirm the literary evidences about location and shifting of royal seat in Delhi; to ascertain the structural activities of pre-Sultanate period, particularly under the Tomars and the Chauhans who established the first city of Delhi in this area and constructed palaces at Lai Kot; and lastly, to know the structural conception of huge depression on the eastern side of the mound, known as Anang Tal.

The excavations were carried out in 28 quadrants of 11 squares, 10 X 10 m each in the Area-I called LKT-I (pl. II). The study of excavated remains confirmed the cultural sequence. Period I revealed three structural phases while the phase I of Period II has two sub-phases. The study of pottery and structure revealed the existence of four structural phases in Period II.

A limited area in the southern half of Qd 2 of square ZC 1 was excavated upto the depth of about 6-50 m below peg ZC1 (pl. III). Different structural phases of Periods I and II were exposed, although the natural soil or bed-rock level could not be reached, in all twenty layers were encountered.

Because of large-scale building activity in different phases of Period II throughout the site, the structures of Period I could be encountered only in two quadrants in limited areas where they could be reached without disturbing any structure. No structures were however, encountered in the first season's work.

The phase I of Period I (Rajput period) is characterized by partly exposed, 2.5 m long medium sized random rubble wall running west to east and attached with the northern section of Qd 2 of ZC1 and another wall, 50 cm thick and 1.0 m long running south to north and joining the first wall at middle as a cross wall. These exposed structures perhaps belong to a room.

A significant feature of this phase was the use of plain red ware, red-slipped ware, red ware decorated with painted design in black or incision, occasionally with stamped designs and applique

bands. Besides there was occasional use of mica dust in pottery. The vases are decorated on the shoulder as well as on the top or side of the rims while the basins decorated on the top of the rim with painted designs. Painted designs comprise mainly criss-cross lines bordered with thin bands and in some cases, only upper side is bordered with a group of bands, horizontal bands or zig-zag lines. The incised designs have wavy lines and horizontal bands, wavy lines intersecting each other, stamped designs in relief with horizontal bands, series of dots, triangles, combination of oblique lines and dots and applique bands with a series of incised or notched oblique lines. Sharp-edged medium-sized bowls with 9-10 cm diameter, small short sided plain lamps, spouted vases occasionally double mouthed, lids with flared rim and ledged interior with flattish base and occasionally flared thick rim lids, cooking *handis* with or without short neck and splayed out rim, small to medium-sized basins - occasionally painted on top of the rim and medium-sized vases are the characteristic shapes of the pottery of phase I. A notable feature was the use of hopscotches made out of red ware sherds, sometimes out of painted red ware sherds.

The phase II (Rajput period) is represented by a partly exposed 2-5 m long and 1 m high medium-sized random rubble wall running west to east which is also attached with northern section of Qd 2 of SqZCl about 30 cm above the wall of phase 1 and two successive floor levels. Another feature of phase II was the use of some variants of plain red ware alongwith the shapes of phase I. Sharp-edged medium-sized bowls with 9-10.5 cm diameter are less in number and changed into small-sized bowls having diametres of 6 to 8 cm. Large storage vases to miniature vases appear in this phase. Some sherds of red ware are decorated with an impressed design of chequer-pattern, incised design with incised or notched triangles in series, applique bands with thumb impression and painted design with filled triangle in series in addition to the continuation of designs of earlier phase. In some cases, extra mud-paste mixed with sand was applied before firing on the lower half of the vases for roughening.

In phase II (Rajput period) partly exposed two medium-sized random rubble walls, both 2-5 m, 30 cm and 80 cm running west to east, were partly exposed, both of them attached with the northern section of Qd 2 of Sq ZC1 and rest one above the other and two floors of red *murram* and mud respectively. The significant feature of this phase was the introduction of inverted flat terminal top lid with the lids of early phases. Large-mouthed shallow cooking *handis* like pans, flat-based dish with splayed out rim and ledged body, thick red ware lid or stand are the additional shapes of this phase. Some sherds are painted with group of horizontal bands in chocolate colour.

A notable feature of phase III was the presence of incised potter's mark like a 'plus' on two lids. One is on the top of the flared rim ledged interior lid and the other is on the interior of the body of the internally beaked rim lid.

In one case clay lumps were applied with some gaps on the outer side of the splayed out rim of a *handi.* In another case a rim of a vase is decorated with notched vertical lines in a series on the outer side. A ring base of grey ware vase with black slip on the exterior also appears in this phase. The hopscotches also continue in all the three phases.

Amongst the antiquities of this period the small rectangular sandstone sculpture of Ganesa in low relief suggesting its use for personal worship and fragmentary lower half of a terracotta mould for

casting Jaina Tirthankara figure (pl. IV A-B) flanked by two attendants wearing different ornaments and clothes are noteworthy.

A copper coin of twelfth century AD, with *Nagari* legend deserves mention here. It bears the figure of *Dev (i)* on the obverse and a crude form of fire altar on the reverse. This coin similar to the coins of Chauhan queen Somaladevi of Shakambhari dynasty, was found in the top level of Period I. Other important antiquities of the period include arrowhead, beads of glass and semiprecious stones, bangle pieces of glass, ivory and bone, finger-ring pieces of copper and semiprecious stones like quartz and lapis lazuli and a few fragmentary terracotta animal figurines such as, a small animal, a pair of horns and leg. A stone head of lion (pl. IV C) and apart of doorjamb in sandstone depicting *mithuna* figures (pl. V A). These were, perhaps, reused in the structural phases of Period II. Two more broken head portions of stone figures were found from the late levels, one of which appears to be an image of Jaina Tirthankara.

In continuation of the previous year's work in Sq Cl, Qd 1, the excavation work was further extended to ascertain the complete plan and its relation to already exposed part of eight lotus petal designed water cistern. The exposed structures of Period II, sub-phase LA, probably formed a portion of palace complex (fig. 1) having at least three rooms (pl. VI) each ornamented with a water cistern in the centre, one side open verandah between room 1 and 2 with decorative lime plaster and pans of drains. Room 1 (7.30 m X 6 m) is ornamented with a magnificent eight lotus petal designed circular water cistern encircled by double drainage finished with fine lime plaster and covered by a 5 cm raised square outline in the centre of the room (pl. VII). In the succeeding phase the drainage was covered with stone chips and a fresh coat of lime floor was applied. Outside the square there were pillars fixed on the corners of the square. Only pillar bases of Rajput style were unearthed which resemble the pillar bases available in a very large number at Quwwatul Islam mosque and Sultan Ghari's tomb and were quite seemingly works of the transitional period of Rajput-Mamluk phase when traditional Indian architecture remained unchanged till the time of Iltutmish whose coins have been found from the working levels of these structures. These pillar bases rest on stone pedestals and are 2.90 m apart from each other. They might have supported some wooden canopy. The room has three openings in the west to a verandah and probably three openings in the north in which west one is clear, the second one is partly clear and the third one is not traceable due to ghost wall and the southern wall of the room has three large niches originally corresponding to the three front openings in the northern wall. On the top or in the upper portions of the extant height of this southern wall there are traces of a series of small intermediary alcoves coming after each of the large niche in the room 1 and its adjoining verandah and room 2. The verandah (6.50 m X 3.50 m) is fully open in north probably to a courtyard and attached with room 1 in the east and room 2 in the west with three openings of 1.05 m wide on each side. The walls of the verandah were provided with a raised decorative band of plaster 1 to 1.5 cm thick and 11 to 13 cm wide just over the 0.75 m high thick dado with a gap of about 5 cm and bordered to the doors. The band is decorated with undercut design of a climber with flowers and leaves between two thin bands (pl. VIII). The artistic design of this scroll work is quite akin to the plaster as well as stone decorations in Balban's tomb and earlier buildings like screen of Quwwatul Islam Mosque, Delhi and Arhai-din-ka-jhopra, Ajmer, both belonging to the end of the twelfth century AD. The decorated designs of plaster were

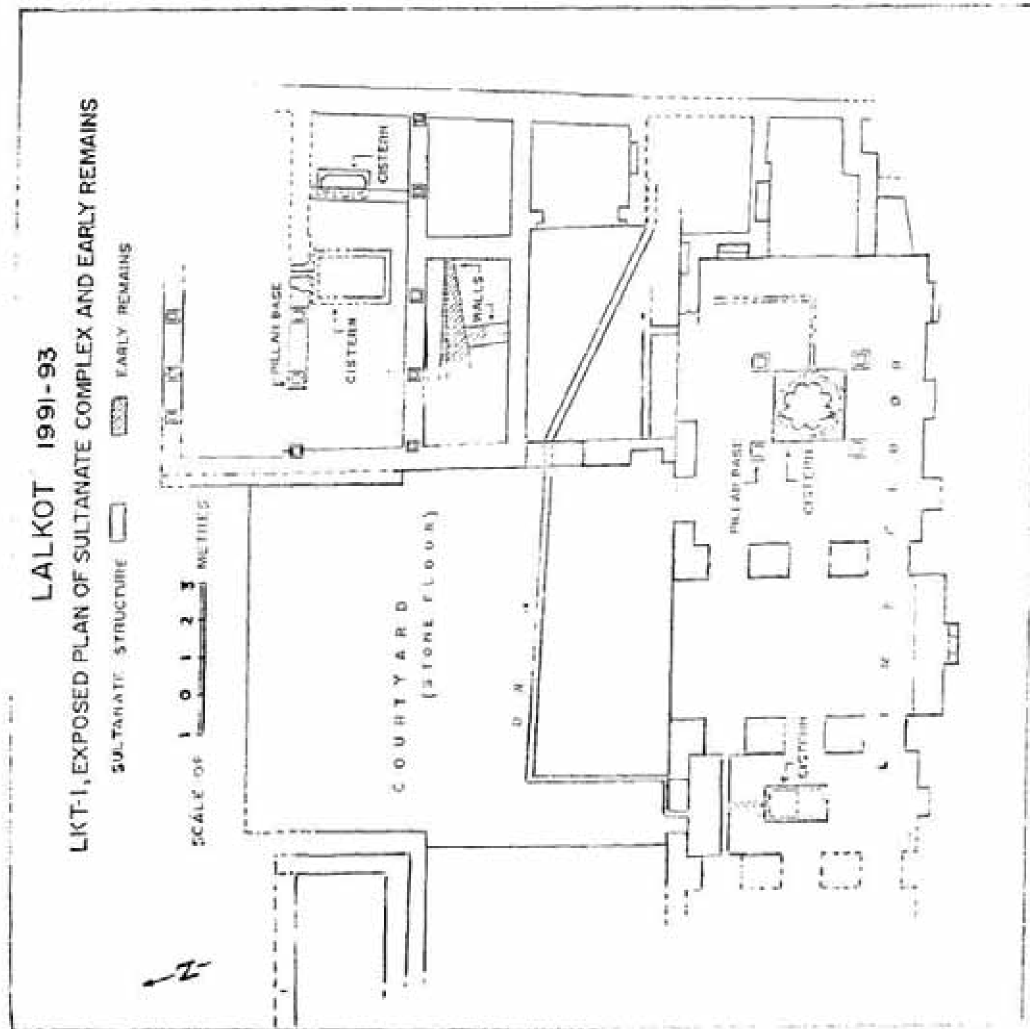

LALKOT 1991-93
LKT-I, EXPOSED PLAN OF SULTANATE COMPLEX AND EARLY REMAINS
SULTANATE STRUCTURE
EARLY REMAINS
SCALE OF 1 0 1 2 3 METRES
N
COURTYARD
(STONE FLOOR)
CISTERN
PILLAR BASE
CISTERN
WALLS
PILLAR BASE
CISTERN
CISTERN

FIG. 1

originally painted with red colour. Some more designs were found on chunks of plaster, like intersecting spirals below decorated arches, different floral patterns and flower-medallions on alcoves, walls and ceilings. Huge quantity of brickbats collected during excavations suggests that the top portions including roof were made of brick masonry.

The verandah has a slightly raised fine lime floor of about 0-85 m wide and a large niche in south. The room 2 (5.65 X 2.70 m) is ornamented with 45 cm deep octagonal water cistern (1.45 X .65 m) with tapered top covered by a 5 cm raised rectangle (1.55 X 0.75 m). This cistern is also provided with a hole (3 cm diameter) for a circular drain in the centre of its northern wall at the bottom probably to clear the cistern from time to time. Marks of stagnation of water were noticed on its inner walls. This room has three openings in the east to the verandah and probably three in the west in which only northern one is exposed and an opening in the north probably to the courtyard. The openings still retain evidences of fine plaster work at the floor level cut into the proper shape for the movement of wooden doors. Evidences were also found in-between two pillars of the wall where plaster has been cut vertically for giving space to the wooden frame of the doors. A large number of iron nails, rings and hooks were found from the levels of these structures which were used in the doors. This room has fine lime floor and plain lime plaster but about 2 cm thick on the 59 cm high dado. In south this room is also provided with a large niche. The room 3 is partly exposed and almost covered by later structures of Sultanate period. This room is also provided with a 45 cm deep octagonal water cistern (1.05 X 0.45 m) with a tapering top covered by a 5 cm raised rectangle (1.35 X 0.60 m). The level of this room is about 1.75 m lower than the level of the room 1 and about 5 cm far from the room 1. The exposed part of lime plastered drain, covered at some places by later structures of Sultanate period is parallel to the room 1 in north and about half a metre lower than the level of room 1. This 22-23 cm deep and about 12 cm wide drain has a slope towards east and runs west to east. The water of the octagonal water cistern of room 2 was also drained probably through this drain. There is another tapered drain coming from south probably from room 1.

The notable feature of structures of this phase was the u se of brick masonry for water cisterns and for making small alcoves as well as upper parts of the random rubble masonry walls from the height of about 1.25 m. All the structures of this phase have fine lime plaster, occasionally decorated bands with paintings in red, besides, fine lime floors. Probably ceilings of these structures were also provided with decorated lime plaster. The fragments of lime plaster of ceiling decorated with undercut design of flowers were recovered from the debris. Another notable feature of this phase was the use of different landing platforms. Room 1, verandah and room 2 etc., have the same floor level, higher than the other parts of the palace complex.

The room with eight lotus petalled water cistern and three-arched openings remind us of the courtyard of Madras at al-Firdaws at Aleppo in the Syrian Islamic Republic which is dated to about AD 1234-37 and is contemporary to this complex.

The characteristic feature of sub-phase IB was the reuse of palace complex with some addition and alteration by constructing partition walls, in some cases either raised directly on the earlier floor levels or raised with foundation after cutting the floors of sub-phase IA.

The residents of phase II reused the palace complex partly, i.e., room 1, verandah and room 2, etc., of phase I almost at a higher portion of the complex and added new stone paved courtyard, rooms, pillared varandah with rectangular water cistern, etc., over the debris of the lower portion of the palace complex of phase I. The octagonal water cistern of room 2 was not in use and was filled with earth and brick-bats and plastered over it.

The central opening of room 2 to the verandah was closed by raising a brick masonry wall. In the north the stone paved courtyard (11.25 X 9.30 m) attached partly with room 1, verandah and room 2 in south was provided with a lime plastered drain which is narrow and shallow at mouth at the northern door of the room 2 and wider and deeper at the end with a slope towards east. The wider portion of the drain was covered with stone slabs. The partly exposed pillared verandah attached to the courtyard in east has eleven pillar bases and a rectangular lime plastered water cistern of brick masonry probably in the centre. A room totally opened to the west and consisting of a large niche in south, towards the east of room 1, another room also totally opened in the west and having a large niche in the north with raised floor and small space for storage provided in the southeastern corner of the room 1 with raised floor were also added in this phase.

In continuation of previous season's work, excavations were resumed in the square YAI towards western side of the so-called inner wall of Lai Kot in order to confirm the period of inner wall which was found to be only the outer western wall of a huge complex belonging to the phase III of Period II (late thirteenth or early fourteenth century AD) and not the inner wall of the fort of Lai Kot as suggested by some of the archaeologists earlier. Excavations here brought to light structures of phase II of Period II in the lower levels abutting the section containing the wall of phase III of Period II. From these lower levels coins of Slave dynasty were found, below which lie the strata of decomposed rock of *murram* and rocky powder of golden and silvery white colour.

The phase III is characterized by two partly exposed random rubble walls, both running west to east (3 m x 0-95 m) and (8.40 m X 1.00 m) respectively. Among them the last one has the remains of lime plaster and both the walls are attached with southern section of Sq Bl, Qd 1 & 2 and Sq Cl, Qd 1 and at some places these walls directly rest upon the walls of the earlier phase.

In phase IV was exposed partly random rubble wall running west to east (4.75 m) which is probably the remaining part of the already exposed wall of the same phase.

Pottery of Period II was almost the same as found in the first season's work, but some more shapes were noticed. A variety of red ware pottery, black-slipped grey ware, thick grey ware in association with plain and painted glazed ware, both of sandy friable variety with gritty whitish core (pl. V B) as, well as ordinary terracotta core are the important features of Period II. A large number of small lamps and broken terracotta lamp-stands have been found. Occasionally Chinese celadon pottery and its local variety were also collected. For the first time four sherds of Chinese porcelain ware were found from the top levels of Period II. Fragments of green glass bottles and vases and terracotta finials decorated with incised, stamped and applique designs were found from different phases of Period II.

More than six hundred antiquities were found during excavations of the second season at Lai Kot,

mostly from the levels of Period II. In all twenty-four copper coins, mostly of horseman and bull types and of Iltutmish and other rulers of Mamluk and Khalji dynasties, two hundred and sixty-eight terracotta human and animal figurines, forty-nine glass, ivory and bone bangle pieces, fifty-six terracotta, glass and stone beads, five ivory objects, five fragmentary stone sculptures and one hundred and forty-eight metal objects were found besides a number of other minor antiquities. The terracotta human figurines (pl. IX) found from the levels of Period II are mostly handmade including bearded soldiers wearing Central Asian long cap or turban and occasionally a dagger attached with their cross-belt. Some of them are horse-riders. Only one headless torso of a female figure was found. Among the animal figurines horse is represented widely. Terracotta figurines are quite similar to those found in the first season.

In continuation of the previous year's work in the southwestern side of the Anang Tal, the work was extended towards west upto Sq G 4 and in Sq J1 in north. The total exposed part seems to be the upper part of the Anang Tal consisting of a retaining wall with a staircase (pl. X A) and two wide landing stepped-platforms in south joined with slopy lime plastered bed-rock lined or retained by large-sized dressed stone blocks at the bottom in the west. About 30 m far from this southwestern part in the northern direction, another upper part of the western side of Anang Tal consists of the same type but less slopy lime plastered bed-rock with vertically trimmed bottom and two wide landing platforms (pl. X B).

The partly exposed southern retaining wall has ten courses with a total height of 2-20 m including an offset at the bottom provided with a staircase made of semi-dressed rectangular stone blocks partly repaired and lined with medium-sized dressed stone blocks of ashlar masonry. The southwestern corner of this wall directly rests upon the slopy rock and makes a corner of Anang Tal. Below the retaining wall is platform 1 (1.20 m wide) made of stone slabs of various sizes of which a few are tightened with iron clamps. Platform 2 below the retaining wall (platform 1) is also partially made in the same method but the southwestern part of platform 2 is filled with stone chips mixed with earth which has strengthened and raised the level of the thick lime concrete plaster probably of Period I.

The partly exposed lime plastered bed-rock filled with debris at the crevices in the western side has a slope towards east and is retained by 1 m high wall of large-sized dressed rectangular stone blocks of ashlar masonry tightened with iron clamps at bottom according to the western side basal plan of the bed-rock. The slope of the bed-rock is made by jutting out small stones, bricks, brick-bats, etc., with mud morter in-between the gaps of the rock and some brick courses in stepped manner, provided at the bottom of the slope over 1 m high retaining wall. But the lime plaster is applied over the slopy surface of the rock as per the shapes and contours of the bed-rock.

Another western part of the lime plastered bed rock is towards north having less slope and made by jutting out stones, earth, etc., in-between the gaps of the rock, but in place of retaining wall, the bottom is vertically trimmed and over which is the lime plaster applied on the whole rock.

The platform 1 in the northern side from top is about 5 m wide and about 80 cm below the slopy rock and is made of rectangular stone slabs which has strengthened and raised the level of the thick lime concrete plaster probably belonging to Period I. The outer core of the platform is made of heavy stone blocks, tightened with iron clamps. 40 cm below it exists the platform 2 made of stone slabs. But these

platforms are about 2 m lower than the southwestern platforms. Like previous year, mason marks were found on the stones used in construction of the southwestern part of Anang Tal. Some mason marks on the stone blocks and slabs are repeated. Amongst the mason marks the *svastika* seems to be more popular.

GOA

16. EXCAVATION AT OLD GOA, DISTRICT NORTH GOA.— Intensive search was made at Ribeira das Galeras, Ribeira Grande, Terreiro dos Vice-Reis, Local do Tribunal da Inquisicao and Rua Direita ou dos Leiloes around Old Goa specially for Chinese pottery by a team headed by K.K. Muhammed assisted by S.K. Joshi and Nambjirajan of Mini Circle Goa of the Survey. All these areas yielded Chinese blue-white pottery bearing various motifs. Out of seven pieces containing Chinese inscriptions only five could be deciphered which are as under.

1. Yung Ching Chang - eternal prosperity and enduring spring
2. Ta Ming Ching Hua Nien Chin-made in the year of Cheng Hua AD 1465-87
3. Yu-Jade
4. Feeling pleasure in the water (Kang Hsi period 1662-1722)
5. Could not be deciphered
6. Shun-1662-1722
7. Could not be deciphered

During the Portuguese period there was brisk trade between Goa and China in Chinese pottery. Rua direita ou dos Leiloes, the hub of Goa's trade and commerce was the meeting point of six streets, each one famous for certain commodities. Here there was a seperate street which traded in silk, satin, velvet and Chinese porcelain.

Another important find from the area of the Local do Tribunal da Inquisicao (Palace of Inquisition) is the Islamic glazed pottery. The ware recovered from Old Goa include deluxe glazed ware and terracotta glazed ware. The Palace of Inquisition was originally the palace of Adil Shah, which was converted into the Viceroy's Palace, after the conquest of Goa by the Portuguese from the Bijapur army in 1510. In 1554 the Viceroy D. Pedro Mascarenhas, who was an old man of seventy, found it difficult to climb the stairs of this building and hence shifted to a house which was previously occupied by the Captain of ships. From the year 1560 this building was occupied by the offices of inquisition and many alterations were carried out to the structure.

17. EXCAVATION AT ST. AUGUSTINE CHURCH COMPLEX, OLD GOA, DISTRICT NORTH GOA.— In continuation of previous year's *(1991-92,* pp. 17-18) excavation, the Mini Circle of the Survey continued excavation at St. Augustine Church complex, Old Goa.

After removing thick bushes and shrubs the area on the southern pan of the main exposed church termed as (Convent) was taken up for excavation to ascertain the layout pattern of buildings,

architectural members and its ancillary parts.

During the period under review part of northwestern, southeastern and southern verandah excluding a small portion was taken up for excavation, the northern side of which was exposed partially in the last season.

The excavation exposed the remains of sunken water tank in the middle of the courtyard (5.62 X 4.25 m). The tank was provided with raised platform (0-80 m) which might have been used by the inmates of the convent. The quadrangle (34.40 X 26.95 m) had a beautiful garden which evoked unstinted admiration from travellers who had come to Old Goa.

The walls and the pillars are found plastered with lime mortar and many coatings of lime were found in the fallen debris.

18. EXPLORATION IN DISTRICT SOUTH GOA.— The Prehistory Branch of the Survey under the direction of A.K. Sharma, assisted by P.V. Janardhanan, C.L. Yadav, P.C. Dogra, Ghayasuddin and T.B. Thapa, explored the following sites.

A sprawling Mesolithic site was discovered at Barcem (15° 57'; 74" 04') which is located 25 km south of Margoa on the slope of the hill overlooking the sea in the west. Just to the west of the village there is an outcrop of quartzite in the lateritic bed. The mesolithic people shaped varieties of Middle Stone Age tools from these quartzite pebbles. In the terraced field nearby, a large number of tools were noticed. Due to the fragile nature of quartzite, majority of the tools were found in damaged condition which comprise handaxes, scrapers (both end and side), burins and points.

Apart from this to the east of the village Madium (14° 57'; 74° 00'), on the hilltop at the height of 350 ft from M.S.L., overlooking the sea in the west an ancient temple site probably of the twelfth-thirteenth century AD was located. The temple was built partly of lateritic blocks and partly by excavating the lateritic bed-rock. The temple is rectangular on plan, facing east. A beautiful image of eight-armed Mahishasuramardini, carved out of granite was noticed in the *garbhagriha* of the temple. Outside the *garbhagriha* on the right side niche contains an image of Ganesa.

Besides this, stray sculptures of Vishnu, Siva and Parvati, Betal and a *Sati* stone were noticed at the twin village of Loliem-Peddam (14° 57' ; 74° 04'). The Betal image is of 3-1 m tall and shown standing on the slope of a hill.

19. EXPLORATION IN DISTRICT SOUTH GOA. — S.K. Lekhwani, assisted by S.S. Gupta, N. Taher, K.M. Girhe, Mala Suple, P.C. Dogra, N.K. Nimje, P.S. Pashine and T.B. Thapa of Prehistory Branch of the Survey discovered a Mesolithic site at Dhapad (14° 57' 15" ; 74° 03' 30"). This site is located between a small hillock to the west of Karwar-Maxim Highway and east of Dariyar river. The artefacts are made on quartz and consists of cores, scrapers, points and flakes.

GUJARAT

20. EXCAVATION AT SHAKTARI TIMBO, MOTI PIPLI, DISTRICT BANASKANTHA.— V.S. Parekh and V.H. Sonawane assisted by P. Ajithprasad of the Department of Archaeology and Ancient History, M.S.

University of Baroda, Vadodara, carried out an excavation at Moti Pipli (23" 49'; 71" 32') in Radhanpur taluk. The site, locally called Shaktari-i- No Timbo is situated about 3 km north of the village on a large sand dune. Adjacent to the site there is a large inter dunal depression known by the same name, Shaktari Talav. Although the entire site measuring 600 x 120 m was systematically dug up a few years back during the drought relief work, it yielded important Harappan affiliated Chalcolithic pottery and microlithic implements on the surface. Due to the disturbed nature of the site, the excavation was done with limited objectives of understanding the stratigraphic context of the Chalcolithic ceramics and sequence of cultures at the site.

The excavation which was confined to a few unexposed areas revealed a regular habitation deposit of 90 cm belonging to the Mesolithic, Harappan affiliated Chalcolithic and Historic periods. The Mesolithic occupation at the site is represented by a 20 cm deposit in the fourth layer lying directly over the natural soil. A number of microlithic blade and flake cores along with a few typical Mesolithic tools like crescents, backed-blades and points were collected. The tools were made of chert, chalcedony, agate and jasper. No pottery was found associated with the Mesolithic industry. Faunal remains collected from this deposit are fragmentary and heavily incrusted with calcium salts. Some of these are charred too.

The Chalcolithic deposit (50 cm) is mainly represented by the layer 2 and 3 in the Trench III, VI, VII and VIII. No evidence of structural remains of the Chalcolithic habitation was found in any of the trenches. A variety of interesting pottery of different types like fine red ware, red ware, buff ware, grey ware, gritty red ware, burnished grey black ware, burnished red ware, black and red ware and reserved slip ware were collected from this deposit. The most interesting group of pottery, however, is a type of fine red ware and buff ware found to be similar in shape and fabric to the pottery from the burials excavated at Nagwada. Important shapes generally wheel-made consisted of large pots, dishes, dish-on-stand, beakers, large beaker like vases with narrow mouth and bulbous body (figs. 2,4) etc. But, some of them were definitely handmade and showed features of scraping and paring on the surface. These were made of fine clay, and adequately fired to have a complete oxidized core. A few of the fine red ware pots were treated with a cream or chocolate slip and painted with thick bands of dark chocolate or black pigment at the rim and shoulder. In addition to these, in some of the pots, red pigment was also used generally on a cream background thereby imparting a polychrome effect (figs. 2,4). A large pot with a very prominent ledge at the neck is interesting giving it an appearance of a double rim (fig. 5). Similar types of vessels were also reported from the pre-Harappan levels at Kot Diji. In fact, all the above mentioned vessels are comparable with the pre-Harappan pottery types from Balakot, Amri and Kot Diji.

Although a few sherds of perforated jar and sherds of Harappan red and buff wares were recovered from the excavation, typical Harappan vessels were extremely rare. Presence of Reserved slip ware is, however, interesting.

The other group of pottery, predominated by the gritty red ware and red ware represent large and medium pots, small pots with constricted neck and bulbous body (figs. 2,3), bowls, basins, dishes and dish-on-stand, are generally decorated with thick bands and lines of dark chocolate or black colour at the rim, neck and shoulder. Such decorations are done mostly on a cream background to get a bichrome

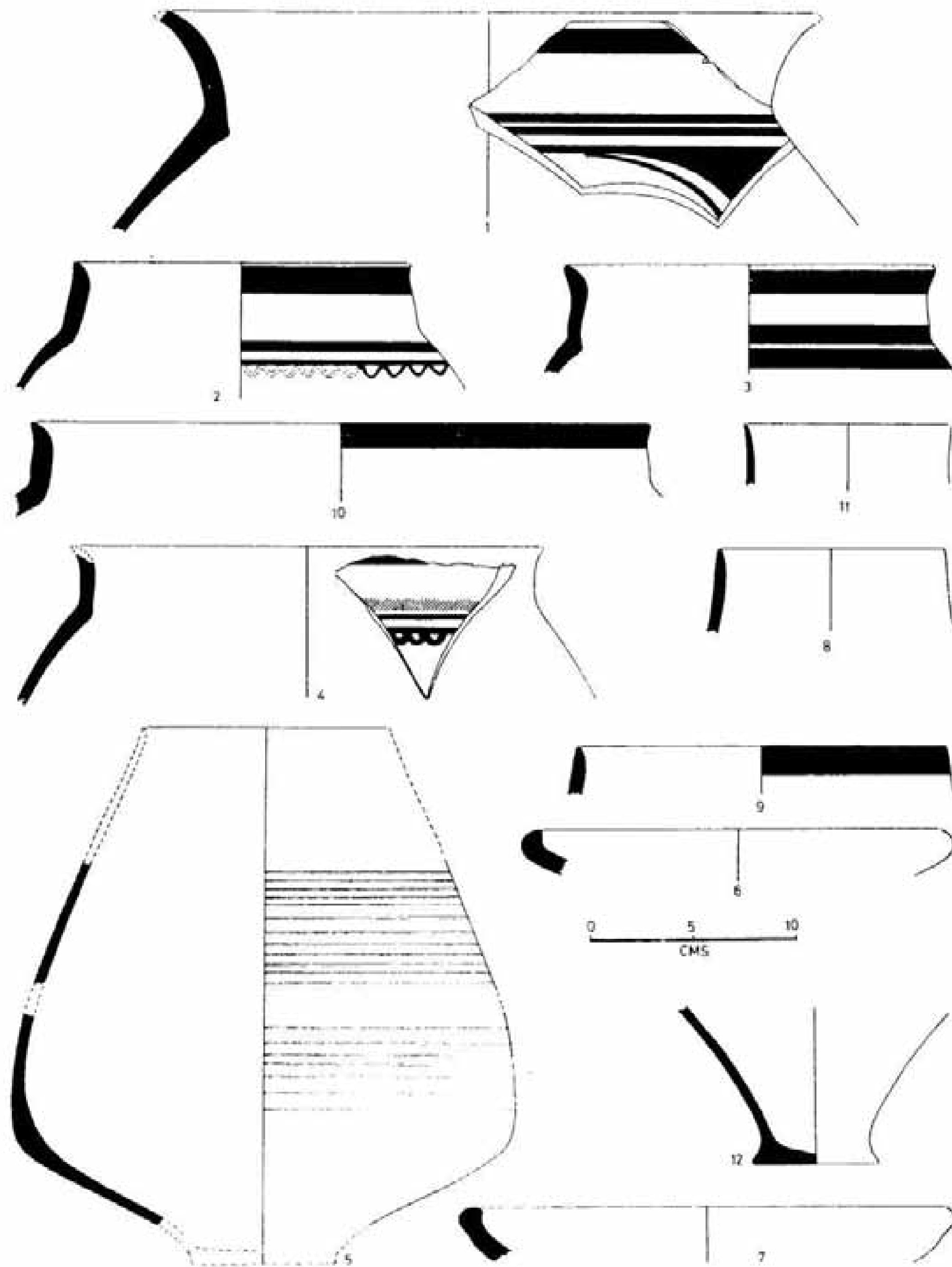


FIG. 2 : *Moti Pipli, pottery types*

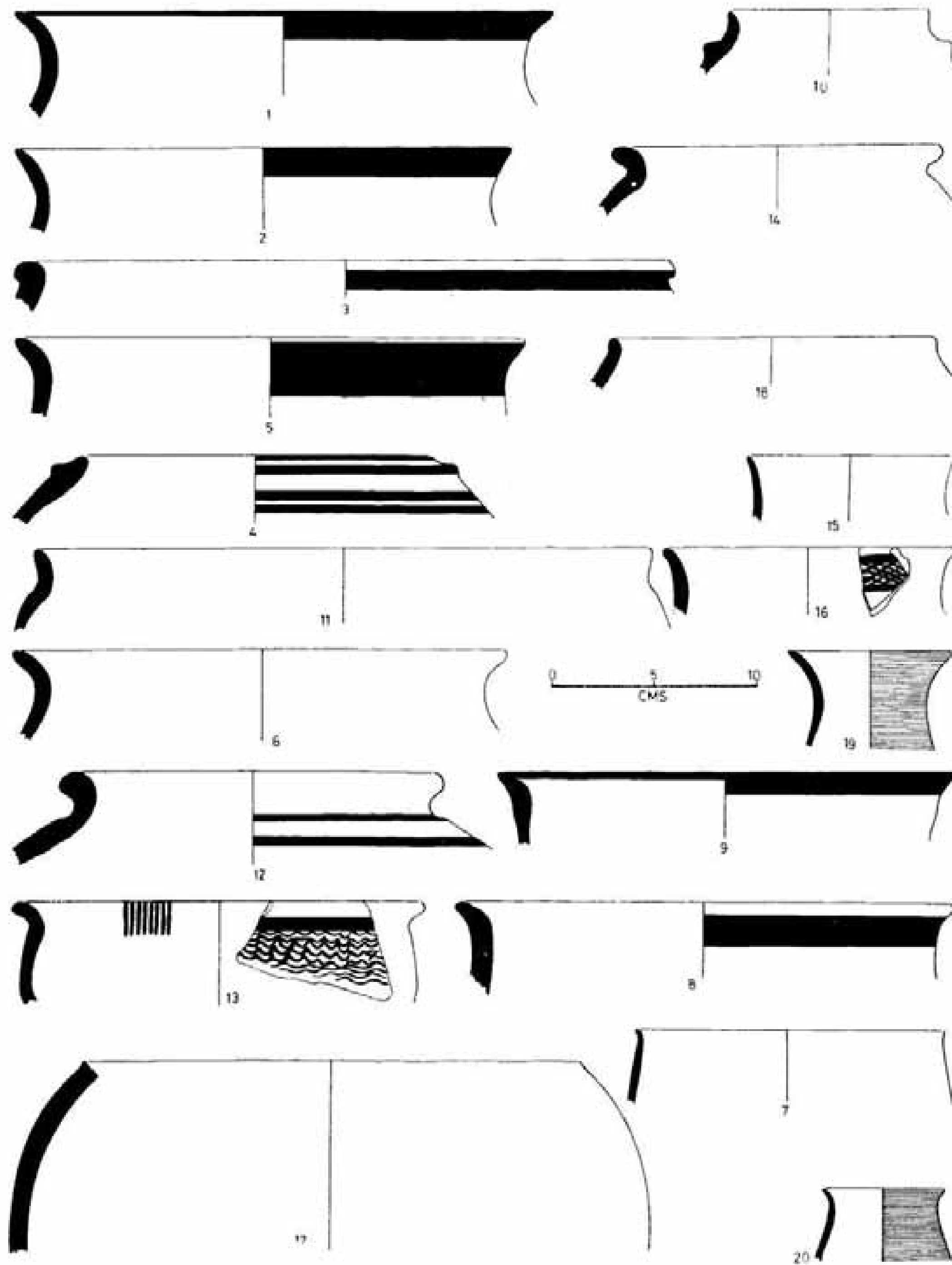


FIG. 3 : *Moti Pipli, pottery types*

effect (figs. 2,3,4). Similar type of jars/pots were also found in burnished grey/black ware and burnished red ware (fig. 3). The site yielded only a few sherds of bowl in black and red ware.

Other important antiquities found in the excavation comprise copper/bronze nail, a folded strip of copper and a fish hook, a number of typical chert/flint, long blades, a few ornamental beads of chalcedony, steatite, lapis lazuli, shell and faience. The collection also included a few biconical and spherical terracotta beads decorated with delicately incised lines and dots, terracotta pellets, terracotta *mushtika* type lumps and a single triangular cake from the surface. A few scrapers and spindle whorls were also collected from this deposit. Faunal remains recovered from the Chalcolithic deposit include skeletal elements like bone, teeth and horn-core of cattle, sheep/goat and deer.

Unlike the Chalcolithic deposit which was mainly concentrated in the southern part of the mound, habitation of the historic period was mainly concentrated in the northern part in layers 1 and 2 of the trenches II, III and IV. The finds comprise a red ware pottery with stamped decoration and typical areca-nut terracotta beads of fifth-sixth century AD and red ware and grey ware of late medieval period.

21. EXPLORATION IN DISTRICT BANASKANTHA.— V.S. Parekh, P. Ajithprasad and P.C. Chaudhary of the Department of Archaeology and Ancient History, M.S. University of Baroda, located three Mesolithic sites, thirty-six Harappan affiliated Chalcolithic sites and eighteen historical sites in the course of their exploration in district Banaskantha. Of the thirty-six newly discovered sites, a majority are found in Santhalpur taluk, on either side of the narrow creek-like depression that connects the great and little Rann of Kutch. A few sites are also located along the margins of the eastward extension of this depression and on the banks of stream channels, situated further north of the Banas river in Radhanpur and Deodhar taluks. All these sites project rural settlements of the Harappa culture belonging mostly to the post urban phase. A few, however, showed regional characters and even early features. There are a few huge factory sites for the production of lithic blades where thousands of long blades of chalcedony and chert were produced.

Historical sites mainly represent the late medieval period. The list of explored sites is given below.

Taluk	*Site*	*Village*	*Nature of remains*
Deodhar	Inderwa no timbo I (80 X 50 m)	Inderwa (24" 01'; 71" 28')	Late Harappan
—do—	Inderwa no timbo II (50 X 30 m)	Inderwa	Mesolithic, Late Harappan
—do—	Kas no timbo	Jorwad (24" 02'; 71" 27')	Medieval
—do—	Kaso timbo	Inderwa (24" 01'; 71" 28')	Medieval

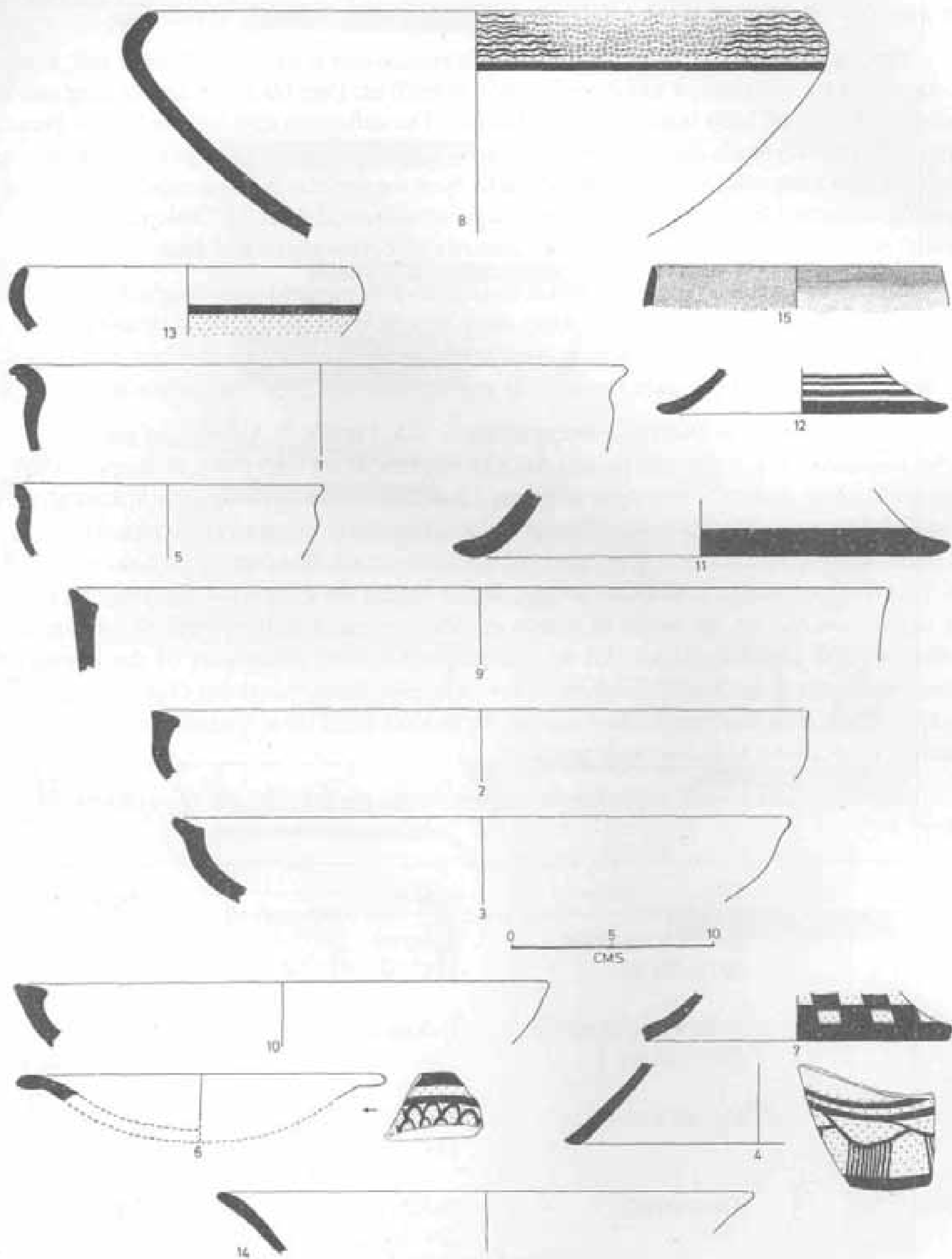


FIG. 4 : *Moti Pipli, pottery types*

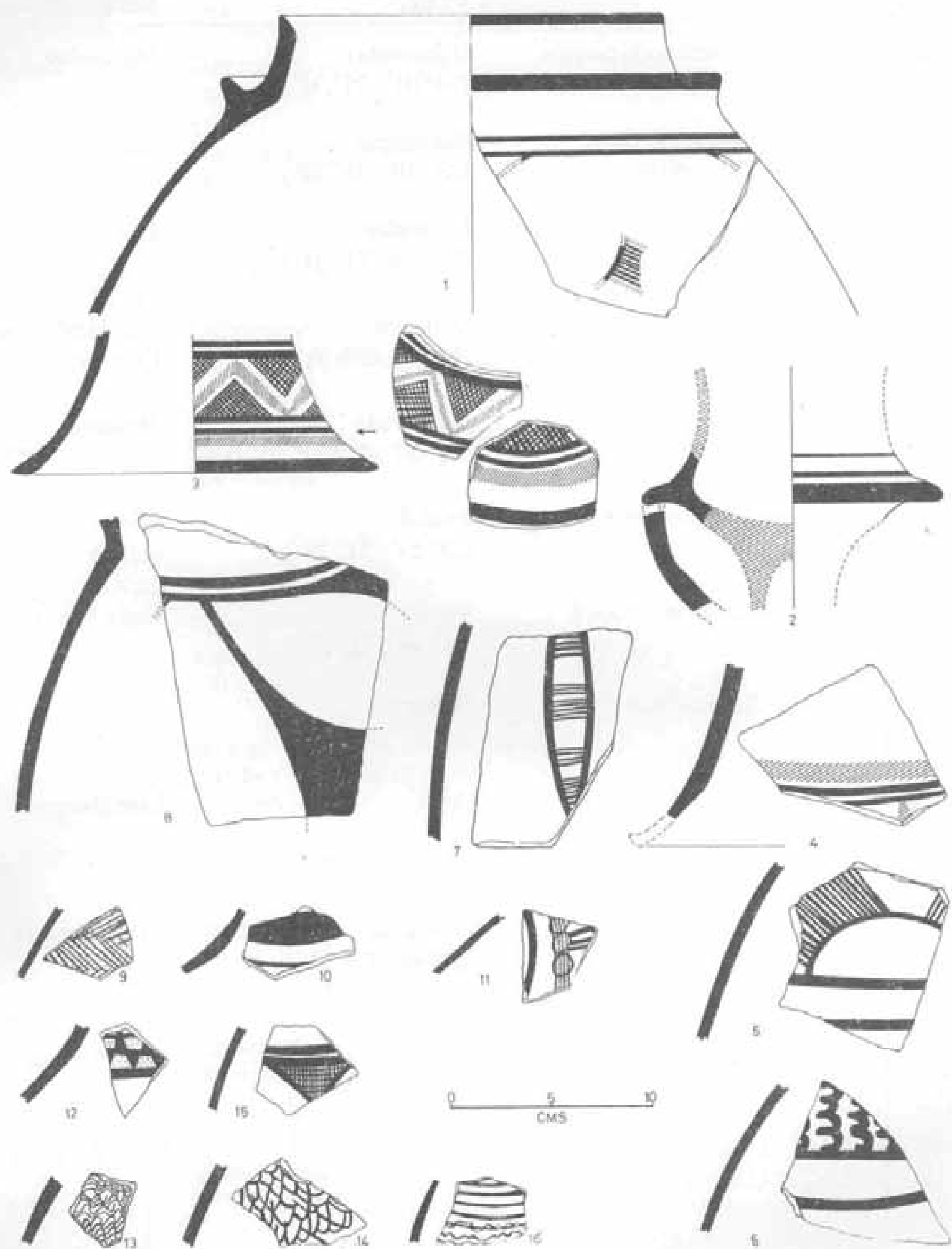


FIG. 5 : *Moti Pipli, pottery types*

Taluk	*Site*	*Village*	*Nature of remains*
Deodhar	Mandir wala thumda	Ujjanwada (24" 01'; 71" 37')	Mesolithic
Radhanpur	Lavana no Ghod (70 x 60 m)	Radhanpur (23" 49'; 71" 35')	Late Harappan, Chalcolithic pottery
	Limbadka no thumda (60 X 50 m)	Limbadka (23" 54'; 71" 31')	Late Harappan
	Patel no Khetar (40 X 40 m)	Koliwada (23" 51'; 71" 30')	Late Harappan, Chalcolithic pottery
	Raniyano timbo	Nayatwada (23" 50'; 71" 32')	Medieval
—do—	Santhli no thumda (90 X 70 m)	Santhli (23" 54'; 71" 29')	Chalcolithic pottery
—do—	Santhli no timba II	Santhli (23" 54'; 71" 29')	Early Medieval
	Sati no Ghod	Bhilot (23'51'; 71" 33')	Medieval Late
Santhalpur	Bhutawed no Ghod (Unrot-II) (60 X 50 m)	Unrot	Harappan
	Chipa no Ghod (Chhanasra-I) (120 x 100 m)	Chhanasra (23" 45'; 71" 18')	Late Harappan
	Datarna-II (20 X 20 m)		Late Harappan
	Datrana-III (15 X 10 m)		Late Harappan

Taluk	*Site*	*Village*	*Nature of remains*
Santhalpur	Datrana-IV (20 x 15 m)		Chalcolithic pottery
	Datrana-V (40 x 30 m)		Late Harappan
	Dudhesar thumda	Babra (23" 59"; 71" 21')	Medieval Late
-do—	Garasya no thumda (Charanda-I) (40 X 30 m)	Charanda (23" 60'; 71" 30')	Harappan
	Genghda thumda (30 X 20 m)	Bambnoli (23" 50'; 71" 22')	Late Harappan and Chalcolithic pottery
	Gherthar no timbo	Vahva (23" 48'; 71" 05')	Medieval
—dc	Ghorapir no Kheter (Datrana-I) (90 X 70 m)	Datrana (23" 46'; 71" 07')	Late Harappan
	Haji no kachha (Varanasri-II) (70 X 60 m)	Varanasri	Chalcolithic blade
—do—	Harihar no thumda (80 X 70 m)	Korda (23" 53'; 71" 22')	Mesolithic, Late Harappan, Chalcolithic pottery, Medieval
	Haren thumda (Datrana-VI) (80 X 70 m)	(23" 47'; 71" 07')	Late Harappan
	Ishwar Ghod (Chhanasra-II) (30 X 30 m)	Chhanasra	Late Harappan and Medieval

Taluk	*Site*	*Village*	*Nature of remains*
Santhalpur	Jakotra no Ghod	Jakotra (23" 51'; 71" 06[1])	Medieval
	Jamathar no thumda (100 X 100 m)	Rajsar (23" 45'; 71" 13')	Late Harappan
	Jhandada no thumda-I (100 X 80 m)	Jhandada (23" 56'; 71" 27')	Late Harappan, Medieval
-do—	Jhandada no thumda-II (10 X 10m(E))	Jhandada	Chalcolithic pottery, Microliths
—do—	Juna Piprala	Juna Piprala (23" 40'; 71" 10')	Medieval
	Kachha no thumda (10 X 10m(E))	Gadha (23" 53'; 71" 25')	Late Harappan, Medieval
- d o —	Kachha no timbo (10 x 10 m)	Dudasan (23" 59'; 71" 20')	Late Harappan, Medieval
	Kaccha timbo	Roju (23" 42'; 71" 05')	Medieval
	Kanakrialo thumda (Charanda-II) (60 X 50 m)	Charanda	Late Harappan
-do—	Katadia no thumda (Varanasri-I) (20 X 20 m)	Varanasri (23" 55'; 71" 20')	Late Harappan
	Kharino Ghod	Bavarda (23" 48'; 71" 13')	Medieval
	Khet padar timbo	Sidhada (23" 49'; 71" 18')	Medieval

Taluk	*Site*	*Village*	*Nature of remains*
Santhalpur	Limbda Ghod	Chhansra (23" 46'; 71" 17')	Medieval
	Madhvyano timbo (40 X 30 m)	Mathutra (23" 44'; 71" 05')	Harappan
	Meplana thumda (80 X 60 m)	Ranmalpura (23" 46'; 71" 09')	Late Harappan and Chalcolithic pottery
	Navod no Ghod	Bavarda (23" 48'; 71" 13')	Medieval
	Orino thumda (70 x 60)	Barara (23" 50'; 71" 09')	Late Harappan, Medieval
	Pepedia timbo (Unrot-I) (40 X 30 m)	Unrot (23" 51'; 71" 20')	Late Harappan
	Rail no Ghod	Bavarda (23" 48'; 71" 13')	Medieval
	Sankatrawala thumda (60 x 50 m)	Jamwada (23" 54'; 71" 20')	Late Harappan, Chalcolithic pottery
	Soont no timbo (20 X 15 m)	Jhajham (23" 57'; 71" 20')	Late Harappan
	Sounda (Bhajuni thumda)	Bambnoli (23" 49'; 71" 21')	Medieval
	Talav no Ghod	Daldi (23" 51'; 71" 20")	Historic, Medieval
	Ukerdo thumda	Babra (23" 49'; 71" 19')	Medieval

Taluk	*Site*	*Village*	*Nature of remains*
Santhalpur	Vatkiwalu kheter-I (Datrana-VII) (100 x 70 m)	(23" 46'; 71" 06')	Mesolithic, Late Harappan
	Vatkiwalu kheter-II (Datrana-VIII) (700 X 500 m)		Mesolithic, Chalcolithic blade
	Vokda no thumda (50 X 40 m)	Daldi (23" 51'; 71" 20')	Late Harappan
Vav	Ganario thumda (60 X 40 m)	Dehisar (23" 56'; 71" 31')	Mesolithic, Late Harappan
	Kharino Khetar (Suneth-II) (60 X 50 m)	Suneth	Chalcolithic blade
	Mata no thumda (Suneth-I) (120 X 90 m)	Suneth (23" 59'; 71" 25')	Late Harappan, Chalcolithic pottery
	Ranchodbhai no timbo	Dudasan (23" 59'; 71" 21')	Medieval

22. EXPLORATION IN DISTRICTS BANASKANTHA AND MAHESANA.— During the course of his exploration under the village-to-village survey scheme Vilas Jadhav of Vadodara Circle of the Survey brought to light the following sites of archaeological interest.

District	*Taluk*	*Village/Site*	*Nature of remains*
Banaskantha	Deesa	Samuo	Sculptures of Ganesa and Chamunda of twelfth century
	Kankrej	Adagam	Temple remains of twelfth century
		Devdarbar	Sculptures of Durga and Ganesa of twelfth century; wall painting and inscription of late medieval period

District	Taluk	Village/Site	Nature of remains
Banaskantha		Jampura	Sculptures of Indra of twelfth century
-do-		Nathapura	Sculptures of Ganesa, Parvati, Vishnu and Siva, twelfth century
-do-		Tana	Wood carving of late medieval period
-do-		Vibhauesda	Habitation mound of medieval period
Mahesana	Patan	Anjiman	Sculptures of Ganesa, Durga and Siva, twelfth century
		Bhilvan	Inscription of medieval period
		Dilwada	Sculptures of Siva, Varahi, Durga, Ganesa of twelfth century and habitation of medieval period
		Jangaral	Hero-stone with inscription of medieval period
		Kimbuva	Sculptures of Siva, Vishnu, Ganesa of twelfth century
		Sagodia	Sculptures of Ganesa, Lakshmi, Durga of twelfth century
		Vagadod	Sculptures of Surya, Ganesa, *apsara,* twelfth century

23. EXCAVATION AT DHOLAVIRA, DISTRICT KACHCHH (EARLIER KUTCH).— In continuation of the previous year's excavation *{1991-92,* pp. 26-35), the Institute of Archaeology, New Delhi, carried out further excavation at Dholavira under the direction of R.S. Bisht assisted by R.P. Sharma, A.K. Patel, B.S. Negi, D.N. Dimri, Y.S. Rawat, Manual Joseph and D.K. Sinha, Puran Singh, Balbir Singh, Ravinder Kumar, H.C. Thapliyal, R.K. Dalai, V.H. Parmar, N.B. Soni, J.B. Makwana and M.S. Rawat. Besides imparting field training to the students of the Institute of Archaeology, New Delhi and other trainee officials, the other objectives of the excavation were: to reconfirm the sequence at select places in each division of the Harappan city; to excavate beside the northwestern corner of Castle to find out whether there lay buried a gateway to Bailey; to gather more details of the layout of the settlement as well as to make probings in the cemetery area which lies to the west of the city.

In most of the divisions like Castle, Bailey, Middle Town, Lower Town, reservoir areas, some of the qudrants were sunk to the natural ground level and the previously observed cultural sequence in respect of each was further confirmed.

In Bailey, the western limit of its built-up area, existence of a reservoir lying immediately further west and also its western arm of the fortification were ascertained and studied in the first main E-W trench. All of them have their origins in Stage III A when Bailey was added to the pre-existing fortress for which, from now onwards, the sobriquet as castle is coined for convenience.

Overlying the natural soil, the domestic architecture made of mud-bricks and furnished with the use of colourful clays for the floors and the plasters was found much eroded while the remains of the later stages were somewhat receded inwards, and thereby suggesting a probable reduction in size of the built-up area during the subsequent stages, *viz.,* IV, V and VI. So far the reservoir is concerned, it was created by removing the natural soil down to the bed-rock.

It was seen that it ramained in use as a reservoir upto Stage V. During the first spell of desertion that ensued, the reservoir started to be filled up with the debris caused by erosion of the deposits of Stages III, IV and V. During the Stage VI, household and industrial waste was being thrown into it. By the time the late Harappans of Stage VII arrived, it was fully filled up. It is why their structures can be seen on the top of the fill.

In the southeastern zone of Bailey, the combined drain of Castle was found descending through a stone masonry cascade into a lower drain now running in Bailey where it was buried under tons of debris of the fortification. In Bailey it was found running for over 35m beyond which it was damaged completely. Its direction was, however, towards the reservoir of Bailey. In the surface substratum of the collapsed debris over the drain, there was found a cache containing a spiral ring of gold, two fragments of two separate copper celts and an assortment of eight hundred and forty-one beads of carnelian, agate, lapis lazuli, steatite, etc., all contained in two late Harappan pots.

The notable finds from Stage III included tall jar bearing bichrome decoration consisting of black and cream bands round its slightly concave-sided body.

Further under the shadow of northwestern corner of Castle, at the northeastern corner of Bailey, there was laid bare a gate facilitating communication with Stadium which ran parallel along the combined length of Castle and Bailey. Like any other gate, this too was provided in the thickness of the defensive wall. A flight of steps provided access from the Stadium ground to the passageway which was flanked by two chambers, one each on the west and the east. The passageway now admeasures 7.3 m in length while the width is 2.32 m at the northern end and 2.55 m at the southern. Its floor rises towards the Bailey area and is paved with flags. Somewhere in the middle, there was a provision for a door of which the sill still remains *in situ.* Of the chambers, the eastern one abuts the Castle wall and registers several building phases. It is 5.10 m long and 1.80 m wide while the western one still remains to be exposed fully. Outside, at the northern end of the passageway, there are placed on both sides a large limestone pillar base each having a convex profile and flattened top and bottom. Each one is roughly dressed and firmly placed on the debris which may have had accumulated during the period of desertion occurring subsequent to Stage V. Both of them should, therefore, belong to Stage VI. From the Stadium

ground, access was obtained through a flight of steps. Now, most of the steps on higher levels are considerably eroded. The stairway was probably 4.78 m broad originally while later, possibly during Stage V, it was narrowed down to 2.45 m, particularly at the northern end.

On both sides of the stairway, there were stepped terraces right against the fortification wall of Castle as well as Bailey - a feature that was observed earlier beside the square end of the from terrace of the north gate of Castle

The available evidence suggests continuous use of the gate-complex during Stages IV, V and VI, although during the last mentioned period, the flag-paved passgeway had been covered by a thick accumulation of the callapsed debris upon which the late Harappans placed these aforesaid pillar bases. Besides they also placed a large limestone slab upon a stone packing along the western side wall of the passageway. All having said, there is a possibility that the gate-system might have come in existence in the beginning of Stage III A itself.

In Middle Town, some more work was carried out on the east gate. A bastion on the south of the gate had been already exposed during the previous seasons, showing two building phases. Initially during Stage III A, it was larger in size and was made of mud-bricks with its outer face being plastered over with colourful clays several times. Subsequently, during Stage III B, it was enlarged by adding more brick-work having similar kind of plastering. However, during Stage IV, the bastion was reduced in size from three sides which, in their turn, were faced with dressed stones. It remained in use as such during the following Stage V as well. On either side of the passageway, there was provided a chamber. The floor of the latter was kept being raised many a time with successive rise of that of the former. Sometime during Stage IV, stone slabs were placed across the passageway for making a door-sill on the side of Lower Town. Upon the sill was placed a stone bar having two series of slots which were obviously meant for receiving wooden planks for closing the gate. The remains of those planks were perhaps suggested by the traces of two bar-like wooden members each of which started from near the stone-bar and ran along and parallel to either side of the passageway. Yet another important evi^nce was the find of a set of larger and smaller post-holes on either side of the gate plausibly suggesting erection of a portico in front of the entrance on the side of Lower Town.

It was also observed that the street which was found running along outside the fortification wall takes turns congruently with the turns of the bastions and the wall and yet without suffering any loss in its width. Further, alignment of the street was demarcated by a row of single or double courses of stones.

The second E-W trench in which the work was carried in the previous years was extended upto the likely run of the eastern city wall, although the said wall along with its flanking streets was found to have eroded completely. Even some parts of the last domestic houses at that end suffered a considerable damage. Besides, human vandalism was also in evidence.

General exposure in Lower Town, as elsewhere in other divisions, was confined to one building phase to an average depth of 50 cm at the extant top. Now that the work in the east-west trench was completed, Lower Town registered a length of about 303 metres over which it is resolved by five N-S running major streets into four built-up zones. Two in the western half, each measuring about 75

metres in breadth, while the other two approximately 65 m each on the east. Of the streets, the one on the west runs along the eastern arm of the Middle Town wall and the other along the city wall on the east. Although the latter could not be traced yet its existence cannot be dismissed on the strength of both empirical and theoratical considerations.

In square 15 X 3, one of the five aforesaid streets running N-S in Lower Town was brought to light and sunk to the virgin ground. This yielded a regular deposit of 3.50 m (2.80 m less than the total accumulation of this division) which originated in Stage III B and then continued into the following two stages. It should be premature to postulate that the eastern zone was younger in date as both nature and man, as already hinted at, were responsible for the drastic reduction of the habitational strata. All the streets of Middle as well as Lower Town were maintained as such throughout the existence of the Harappan city.

In Lower Town, an unusually large house with an extensive courtyard, a stone-flagged room was partially laid bare. Unfortunately, it had suffered a large-scale spoliation at the hands of stone-robbers. Elsewhere, evidence of draft activities were witnessed at several places. On account of restricted nature of excavation, not much about individual houses could be gathered, albeit a variety of architecture was exposed and a lot of study material was collected.

The present excavation shed fresh light on the sepulchral architecture of the Harappans. The cemetery is situated to the west of the city with phenomenal density of structures in the south-west where there runs the Manhar torrent. Besides, there lies an extensive field which perhaps overlies a buried reservoir according to a study of satellite imagery by a hydrogeologist. In all, six grave structures were subjected to probings. Two of them were almost rectangular pits lined with large slabs of yellow limestone. In one case, one of the capstones was found broken and sunk into the fill of the dug-out while the others were found missing. Inside the pit, which was oriented in north-south direction with a depth of 2 metres, there was deposited a thick water-borne silt. The grave was certainly disturbed by robbers or miscreants. However, in lower levels, there were found many dishes of coarse red ware. The other, an identical one, 2 m deep pit, lined with large slabs of yellow limestone, the capstones being missing, was otherwise found intact. Most curiously, it yielded a 5 cm thick structure made of fine-grained grey coloured clay, showing a thin smearing of red clay. On the north, there was a marked convexity and, on the south, a slight concavity. The latter in a manner that the corners protruded like short stumps. At a first look, it appeared like a coffin but there was no skeleton inside. At some height, above the level of the coffin-like structure, there was placed on the north a dish-on-stand on one side and a water-vessel on the other. Along the side of and underneath the coffin, there were placed a variety of pottery forms and stones as prop to coffin. The northern slab of the structure bear two gaps, perhaps intentionally made portholes for making subsequent offerings to the dead. No further probe outside on the north could be made in this season. One oval-shaped grave with its broader side on the east and narrower on the west was made of random rubble piled in a pit, Another similarly oriented grave was made of random rubble, placed in a thick pile inside an oval pit as well as above the ground. In the eastern side, there was found a collection of pottery containing a dish-on-stand, a vase with a perforated bowl-lid, etc., while nothing else was seen in the western part. One structure, laid out in NE-SW orientation with two large stone slabs

marking the boundary of the pit, yielded pottery as grave goods. Interestingly, a single pot was placed in a circle marked by small stones.

It is quite intriguing that in no case any skeleton or bodily remains were found in the fill of the architecture. The soil collected from the pottery for analysis may provide some information with regard to the mode of disposal. The entire evidence was contrary to the general funerary architecture as well as practices of the Harappans. All those architectural forms might be cenotaphs.

The season's excavation yielded a large amount of antiquities including seals and sealings, chert weights, chert blades and bladelets, beads of copper, semiprecious stones, steatite, clay shell and faience, etc. A total number of twenty-eight seals and twelve sealings were collected, thus making the total number of seals and sealings to hundred and one and forty-nine respectively, so far recovered from the Dholavira excavations. The find of a copper beaker in the E-W trench of Middle Town was also an important item. It contained another copper beaker. So far the other contents in the said receptacles are concerned, those, if any, are yet to be gleaned after evacuation by experts as both the copper containers are in a very fragile condition. As already mentioned earlier, a hoard of eight hundred and forty-one beads of different materials and sizes alongwith one gold ring, two broken copper celts, were found placed in two late Harappan posts.

24. EXCAVATION AT ROJDI, DISTRICT RAJKOT.— The excavation at Rojdi in village Shrinathgadh, taluk Gondal, was carried out jointly under the direction of D.P. Mehta and G.L. Possehl of the Department of Archaeology, Government of Gujarat and the University Museum, Pennsylvania, USA. respectively. Other members of the team included A.D. Gosai, C.C. Joshi, S.P. Mehta, H.S. Shah, P.P. Chudasama, NJ. Vyas, V.T. Fadadu, P.B. Otia and A.C. Pathak of the Department of Archaeology, Government of Gujarat and John Macginnis, Junice Bailey-Goldschmidt, Alexi Vranich, Monica Smith, Jason Vager, Shinu Abraham, Virchand Dharamsy and Popatlal of the University Museum, Pennsylvania, USA.

The work was started with the layout of trenches to the west of the excavation which was exposed previously on the main mound. The occupation revealed four principal architectural features : a complex of rooms arranged along a very long wall, one complete house, an extra-mural working area and an inner fortification.

The complex of rooms was partly exposed during this season. A series of five rooms, all linked to a common wall with east-west orientation was noticed. In one of these rooms, we found two ruined grain storage silos and signs of burning on a floor surface. Two collapsed pots were found slightly set in this floor in one corner of the room. Both were typical Harappan red ware jars. Other Harappan pots were found in the corners of other rooms in this architectural complex.

One complete house was also found in the north-west corner in the inner fortification. It consists of three rooms, an entrance foyer, the central living area and a small enclosure that seems to have been used for storage although no particular concentration of pottery was found there. The house has a very finely fashioned threshold stone at the main entrance, and was rather well constructed as a whole. The base of a Harappan dish-on-stand was recovered from the floor of the entrance foyer, near the threshold stone.

The northeastern sector of this year's excavation was an open area without walls. A series of irregular flat stones, that appear to have originally been laid in rough circles were found here. These seems to be the remains of working floors, possibly used for threshing. The surface around these floors contained dark patches due to surface burning. No hearth was however, traced here.

An inner fortification wall found in all the three trenches runs in north-south direction on the western edge of the main mound, parallel to the circumvallation that is a prominent surface feature of Rojdi. The fortification underwent two phases of construction. In the first phase a wall (2 m thick) was raised. This was later expanded on the inner side to three metres. Only the foundation of this wall survived, showing the use of large stones. The design and construction of this fortification wall is very much like that of the circumvallation. There is no medieval occupation here on the western edge of the mound in the vicinity of the inner fortification. The excavation revealed only Harappan pottery in this area some of which were embedded in the earth matrix of the wall itself. Other Harappan pottery came from the deposits over the wall as also from both the sides of the foundation. As is seen on the site plan, the Rojdi C architecture fits in an harmonious way with the alignment of the inner fortification suggesting its use during this occupation of the main mound. It could, however, have a long history and go back as far in time as Rojdi A.

Among the antiquities found during this season mention may be made of copper based implements, including a fine fishhook without a barb; carnelian, shell and terracotta beads; spindle whorls, generally made on recycled potsherds. Several fine examples of Harappan graffiti were also recovered. The pottery from Rojdi C resemble the sturdy red and buff wares apart from the Harappan coarse ware reported earlier. Important shapes comprise mainly the bowls mostly hemispherical besides, the dish-on-stand, large storage jars, small jars, plates and dishes. Most noteworthy is the elongated stud handle of one of the distinctive Harappan drinking bowls.

25. EXPLORATION IN DISTRICT VADODARA.— G.T. Shendey of Excavation Branch V of the Survey assisted by S.B. Parmar, V.H. Parmar, N.B. Soni and J.B. Makwana discovered the following sites ranging from early medieval to medieval periods.

Taluk	*Village/Site*	*Nature of remains*
Chotaudaipur	Tejgadh (22° 22'; 73° 55')	Ruins of medieval period fort walls, small shrines and a step-well
Dabhoi	Kuvarwada (22° 15'; 73° 20')	Remains of Kataccuri and medieval period
Nasvadi	Ghatamli (21° 58'; 73° 58')	Ruins of two ancient temples and a step-well

26. EXPLORATIONS IN THE SUKHI VALLEY, DISTRICT VADODARA.—As a part of the palaeoenvironmental and prehistoric research project sponsored by the Ford Foundation Grant, P. Ajithprasad of the Department of Archaeology and Ancient History, M.S. University of Baroda, carried out an exploration in the lower Sukhi valley and brought to light a number of primary acheulian localities, early Middle

Palaeolithic localities, Mesolithic sites including rock-shelters with paintings and remains of historic period structures and inscriptions. The Sukhi flows in die northeastern part of Vadodara before it joins the Orsang at Sihod. The exploration was confined to the lower part of the valley between Sihod (22° 19'; 73° 48') and Dungarwant (22° 26'; 73° 52') villages covering an area of 100 sq km.

The Acheulian localities not much disturbed from their original locale of deposition are discovered in the villages of Bhanpur, Narvaniya, Ghuttiya, Raipur, Hathipagla and Kevada. Barring Kevada, all these localities are situated in the foot of the hilly ridges that flank the northern margin of the valley and in the piedmont. Kevada on the other hand is situated on top of a hill about 150 m above the ground level surrounded by even higher quartzite ridges. The Acheulian locality here is located close to a mountain spring. It is for the first time such hill top sites belonging to the Acheulian period are discovered in Gujarat.

Acheulian localities are discovered as discrete clusters of artefacts spread over the open agricultural or forested land which are now being exposed due to recent intensive agricultural operation, denudation of forest and erosion. Overall size of the Acheulian locality varies from 80 x 70 m to a meagre 3 x 4 m. The richest locality at Raipur yielded more than one hundred and fifty artefacts from an area of 16 sqm. Acheulian handaxes, cleavers, scrapers, knives, chopping tools and retouched flakes all made in locally available quartzite are the important artefacts collected from the valley. The assemblage also included plenty of simple waste flakes, broken and unfinished artefacts and exhausted cores. The collection is dominated by upper Acheulian artefacts showing regular shape, uniformly thin, oval or subtriangular cross section and extremely delicate workmanship.

Stratigraphically the Acheulian artefacts occur in the coarse pebbly gravel deposit at the base of the alluvial strata exposed in the section of the Sukhi river. At the foot hill area and in the piedmont of the valley there occur two distinctive quaternary formations incorporating Acheulian artefacts. The Acheulian artefacts found in the older formation (Narwaniya formation) are weathered and abraded while those in the younger formation (Bhanpur formation) are fresh and unabraded. This may indicate two distinctive and temporally separated depositional events.

Besides these there are a few localities in the area which belong to the early Middle Palaeolithic period showing a transition phase between the Lower Palaeolithic and the Middle Palaeolithic periods. Artefacts from these localities show a progressive refinement and attenuation of Acheulian bifaces. This trend culminates in the preponderance of flake tools, predominantly scrapers made by the Levallois technique. Stratigraphically these belong to the Bhanpur formation lying over the upper Acheulian artefacts. At many localities these two types of tools are found mixed together.

Mesolithic sites are far and few between the region. Only two sites belonging to this period are discovered during the exploration. One of these is in the Ghuttiya village at the foot of the Makhaniya hill, around a small flat whale-back granite outcrop. The second one is a rock-shelter in the Raipur hill at about 30 m high from the ground level. At both these sites microlithic artefacts like points, lunates and backed-blades were made of quartz. Mesolithic paintings on the walls of the rock-shelter are found in the hills of Raipur and Makhaniya. A complicated geometric pattern (Makhaniya), and an animal figure (deer/goat) with its body decorated with diamond-like pattern (Raipur) and drawings of dancing

figure holding each other's arm in ochre colour are some of the important paintings belonging to this period.

Historical remains and inscription of the sixth-seventh century AD, located on top of the Makhaniya hill at a height of about 300 m include a large structure built around a natural depressionin the granite rock. The structure is built of a 2-5 m wide rubble base wall followed by large bricks of 42 X 16 X 8 cm. Walls of the caves and rock-shelters around this structure have fragmentary inscription in Brahmi characters.

HARYANA

27. EXPLORATION AT ARANGPUR, DISTRICT FARIDABAD. — In continuation of previous work *(1991 -92,* pp. 35-37), A.K. Sharma, assisted by J.S. Dubey, Pyara Singh, K.M. Girhe, C.L. Yadav, Ghayasuddin and R.G. Katole of Prehistory Branch in collaboration with Excavation Branch -II of the Survey, carried out investigations around the Palaeolithic site at Arangpur (28° 27'; 77° 15' 56"). The main objective was to trace the developmental sequence of Palaeolithic culture in the area and to confirm the presence of early man along the course of palaeochannels of Yamuna, particularly fifth and fourth palaeochannels.

From the right bank of fifth palaeochannel artefacts belonging to late Acheulian period have been collected both from surface and stratified deposit. The tools are all on flake, comprising mainly handaxes, cleavers, end and side scrapers, discoids and points. The occurrence of cores, waste flakes, semi-finished and finished tools clearly indicate that the area around was a factory site.

The fourth palaeochannel which lies nearly 2 km west of the implementiferous area of fifth palaeochannel has yielded the evidence of Early Acheulian from its right bank. The section noticed here shows the implementiferous horizon overlying quartzitic sandstone bed-rock. Capping the implementiferous horizon is the river sediments of 0.60 to 0.70 m thick, which underlies a 0.70 m thick calcareous deposit consisting of granules rich in calcium-carbonate. The artefacts belonging to early Acheulian are mostly fabricated on fine grained sandstone and few are on quartz nodules. The tool kit comprises handaxes, cleavers, scrapers, notched-scrapers, points, discoids of comparatively bigger sizes, apart from plenty of waste flakes. The tools are comparatively larger in size with few flakes removed to shape them. All the tools are on flakes.

28. EXPLORATION IN DISTRICT KARNAL.— During the course of exploration P.K. Mishra of the Chandigarh Circle of the Survey discovered a Kushana stupa at Asandh located about 44 km south-west of Karnal. A considerable part of the present town lies on the ancient mound the most part of which rises like a massive circular tower (60 ft), locally known as the fort of Jarasandha, associated by the inhabitants with king Jarasandha of Mahabharata. The stupa mound of the Kushana period consists of concentric circular walls of bricks (25 x 35 cm) filled with earth and brick-bats.

29. EXCAVATION AT BALU, DISTRICT KAITHAL.— In continuation of the earlier work, the Department of Ancient Indian History, Culture and Archaeology, Kurukshetra University, Kurukshetra, resumed the excavations at Balu under the direction of U.V. Singh, S.P. Shukla, Arun Kesarwani and B.K.

Kathil. In all eleven trenches, numbering Cl to Ml, were laid inside the fortified area of the township at Balu in order to gather evidence of the formative stage, period of efflorescence and decline of the Harappan civilization. Excepting one trench (HI), in all other trenches the digging was done only in a restricted area.

In trench C1 three phases of building activity were noticed in the deposit of 55 cm. It also revealed the walls of three houses made of mud-bricks (40 X 20 X 10 cm). These were single brick-lined houses belonging to later phase of the classical Harappan civilization. Carbonized wheat/barley was collected lying near the wall. In the adjoining trench (Dl) in the northwestern corner, backside of a mud-brick house, was seen laid diagonally. In its construction mud-bricks (36 X 18 X 9 cm) were used. Truncated wall of another house, running diagonally from north-west to south-east was excavated. To the west of it the area was found filled with ash, pottery, cakes, etc. The firm ground below it showed the evidence of successive burning. The quarter part of this trench towards south-east side showed a mud-brick wall (brick size 40 X 20 X 10 cm) which was diagonally running from north-west to east-south alongwith floor made of mud lumps or broken mud-bricks. The fragments of a big S-shaped jar were recovered from the debris lying over it. Another trench (El) yielded the evidence of a floor made of bricks (size 32 x 18 x 9 cm) roughly triangular in shape with its base (3.60 cm) touching the western side of the trench line below the surface. In trench (Fl) a house with two walls were exposed. A stone quern was recovered from its floor. The central portion had a reddish patch on the ground perhaps as a result of burning. The outer side of another house was seen running diagonally forming a lane in-between two houses. Its wall was destroyed due to a later pit and fire activity. In trench Gl, below the depth of 89 cm, a few mud-bricks and burnt pieces were found on the floor which were connected with fire-places traced in the next adjoining trench (HI). The fire-places which were time and again built at one place in this trench, remained partly concealed under the baulk (pl. XIA). These were plastered successively with lime or white material. One fire-place built here was elliptical in shape (169 X 96 cm). Baked or unbaked clay cakes were set to form the fire-place with carbonized wheat/barley grains scattered around it. The presence of charred bones and grains scattered in and outside the fire-places, indicated some sort of Harappan religious ritual. In this trench a massive wall of mud-bricks (32 X 16 X 8 cm) of a house was seen in the corner. Separated by a few layers another mud-brick wall, probably enclosing the kitchen, was exposed at a depth of 2.05 m. Digging upto natural soil was done in this trench in the northeastern corner which revealed pottery belonging to phase A, i.e., pre-Harappan culture. In this area a circular pit of 60 cm deep (dia 2.20 cm) filled with pre-Harappan broken pottery, ash, burnt pieces of oven, etc., was exposed.

In trench I^1 two walls of a house, made of single brick line (brick size 31 X 15 X 8 cm) was exposed below the surface. Similarly in four other trenches (Jl to Ml) house plans of three or four structural phases were found overlapping and intersecting each other below the surface. Their chronological position will be determined through further excavations. In one trench (Kl) a half-buried jar, now broken, was found filled with terracotta cakes and nodules. In this area (from trench Cl to Ml) at least eight successive phases of structural activity were noticed.

Besides, broken pottery and a few antiquities no evidence of structural activity of phase A (pre-35

Harappan) could be found. Massive Harappan structures gradually declined with the passage of time. The pottery showed the mixture of pre-Harappan and Harappan traditions (pl. XIB). The discovery of copper, stone, terracotta, faience, steatite, shell and bone objects, mainly belonging to phase B (Harappan), throw light on their ornaments, play-things, instruments and implements for every-day use. The recovery of a fluted core of chert from the site indicates that the stone was imported as raw material from Sind but blades were made locally.

HIMACHAL PRADESH

30. EXCAVATION AT DAT NAGAR, DISTRICT SHIMLA.— Chandigarh Circle of the Survey carried out excavation under the direction of Hari Manjhi assisted by Phanikanta Mishra, Onkar Chauhan, Jasmer Singh, Baldev Singh, Vinod Kumar and V.B. Thapa to ascertain the cultural sequence of the mound.

The site taken up for excavation was badly disturbed due to flood. As a result of which the deposit mixed up with sand for about lm. Trenches were found laid in the western side. At one of the squares, there is evidence of rectangular chamber of stone in XCl the plan of which could not be ascertained. The pottery from this deposit is mainly wheel-made comprising a red ware, of both coarse and fine variety with or without slip. The characteristic types in the ware are the lipped and small chanelled bowl, fragments of squat dish or bowl-on-stand (?) and basin.

It may, however, be mentioned here that no further evidence regarding other cultural equipment could be obtained due to the huge sand deposit. The excavation could not be done in all the trenches upto the natural soil. The structural activity, revealed fascinating data of an urban Kushana settlement for the first time in this region. Structurally, the period has two sub-periods. The stones used in the chamber are of smaller as well as bigger size.

The small finds from the habitation comprised dishes with or without single perforations, rattles, wheeled-toys, potter's stamp, pestle, terracotta toy pieces and game pieces, copper objects, iron nails, Kushana broken stone sculpture (flat piece), bone pendants, coin, beads of carnelian, terracotta and micro beads, iron nails, bangle pieces along with forty-one other antiquities.

JAMMU AND KASHMIR

31. EXPLORATION IN UPPER INDUS VALLEY, DISTRICT LEH.— The Srinagar Circle of the Survey conducted intensive exploration in the remote valleys of the river Indus and its tributatries in Nubra and Changthang region under the direction of R.S. Fonia, assisted by L.P. Thapliyal, A.K. Pandey, Puran Singh, Balbir Singh and Tsering Wangchuk and located the following sites of archaeological interest.

Tehsil	*Village/Site*	*Nature of remains*
Diskit	Diskit Nubra Valley (34° 33' 0"; 77° 33' 30")	Remains of rock engravings and a *gonpa* datable to tenth century
—do—	Hundar (34° 35' 20"; 77° 27' 50")	Stone sculptures (pl. XII) of Maitreya (sixth-seventh century), Maitreya temple, Nyongpa palace and group of temples datable to sixteenth century. Remains of watchtower and ancient Dard habitation datable to fifteenth century

Tehsil	*Village/Site*	*Nature of remains*
Diskit	Hunder Dok (34° 30' 20"; 70° 27' 50")	Pre-historic cave and mural paintings
	Khalsar (34° 29' 30"; 77° 42')	Rock engravings of ibex, hunting scene and *a gonpa* datable to nineteenth century
	Murginala (34° 45' 50"; 77° 31' 50")	Rock engravings of ibex, human palm and hunting scene and a rock shelter
—do—	Sum-ur (34° 37' 20"; 77° 37' 0")	Sumur and Samastanling *gonpa* datable to ninteenth century and rock engravings of Maitreya and Vajrapani datable to eighth century (pl. XIII A)
	Ti-Khar (34° 37' 20"; 77° 37' 0")	Old palace
	Skampuk (34° 37' 30"; 77° 26' 20")	*Gonpa* datable to seventeenth century dedicated to Avalokitesvara and rock engravings
	Skuru (34° 44' 30"; 77° 17' 30")	*Gonpa* datable to seventeenth century
—do—	Tirisa (34° 44' 10"; 77° 34' 0")	Pre-historic site, rock engravings of ibex and hunting scene, watchtower and toll post of Dard rulers
	Tirath Tirit (34° 32' 30"; 77° 38' 30")	Rock-cut sculpture of Maitreya of eighth-ninth century (pl. XIII B) and engravings of ibex and hunting scene
—do—	Yensa Densa (34° 48' 30"; 77° 30' 10")	Rock-cut sculpture of Maitreya datable to eighth century, *gonpa* and a foot print
—do—	Panamik (34° 47' 30"; 77° 32' 30")	Rock-shelters, hot spring and *gonpa*
Leh	Gaik Changthang Valley (33° 33’ 20"; 77° 9' 40")	Pre-historic site hearth, fire place and a *chorten*
—do—	Kiari (33° 29' 0"; 78° *T* 40")	Rock engravings

INDUS VALLEY (CHANGTHANG)

Tehsil	*Village/Site*	*Nature of remains*
Leh	Litche (33° 43' 40"; 77° 57' 30")	Rock engravings of ibex, *yak* and hunting scene of sheep datable to seventh-eighth century
	Niormis (33° 26'0"; 78° 12'30")	Rock engravings on the boulders representing ibex, *yak,* hunting scene, camel and conical huts
	Nyoma (33° 12'0";78° 12'30")	Rock engravings of ibex, *yak, hunting* scene, a *gonpa,* a fort and remains of ancient habitation
	Pugga (33°0'0";78°0'0")	Cave dwellings and borax plants
	Tso-Kher (33° 0' 0"; 78° 0' 0")	Cave dwellings and salt lake

KARNATAKA

32. EXCAVATION AT HAMPI, DISTRICT BELLARY.—In continuation of the previous year's work *(1991-92,* pp. 39-41), the Bangalore Circle of the Survey under the direction of K.P. Poonacha, assisted by S.V. Venkateshaiah, P. Venkatesan, C.S. Seshadri, W.V.S. Narasimhan, Anandateertha, T.P. Balakrishna Unnithan and M.V. Mallikarjuna, resumed excavation at Hampi in the area located to the north of STR-1 and south-west of STR-1 and 2 within the enclosure situated to the north-east of the Saraswati temple and in the area south-west of the enclosure. The excavation was aimed at exposing the complete plan of the buried structures and understanding the general layout pattern, functional aspects and the probable relationship of the exposed structure with those of the Royal enclosure and the temples in the surrounding area.

Excavation in an area of 6,000 sq in yielded remains of two rectangular palatial structures, *viz.,* STR-3 and STR-4, facing respectively north and east, water storage tanks and a network of channels connected to them as also portions of the enclosure wall surrounding the complex (pl. XIV).

STR-3 located to the north of STR-1, is in highly disturbed condition. The available evidences indicate that it is a rectangular palatial structure facing north. It is a 'U' shaped structure comprising three landings with a square chamber on the topmost landing on the south and a courtyard on the northern extremity. Like STR-1 here also the landings are differentiated by basements having moulded *adhisthanas.* The basements were provided with steps flanked by *yali* balustrades. Extant evidences show that the floors at different levels were lime plastered.

To the south-east of STR-3 and to the proper north of STR-1, is yet another small, rectangular, east facing structure. It has two rectangular chambers, the eastern being slightly larger than the western one. To the east of this structure is a plastered open courtyard providing entry into the spacious courtyard of STR-1 through its sham entrance on the north. Further north of this small structure is a zig-zag entrance leading to the courtyard of STR-3.

STR-4 located south-west of STR-1, is a rectangular palatial structure facing east with its longer axis in east-west orientation. The structure rises in two different levels. The first level has pillar bases in a row whereas the second level has moulded courses of *adhisthana* comprising an *upana,* an *adhokumuda, kantha* and an *urdhva-kumuda.* The *adhisthana* mouldings, as also the floor of each level are plastered time and again. Each level is provided with steps either at the centre or at the corners.

STR-4 has a large, plastered courtyard on the eastern extremity. This courtyard is approached through the southern entrance provided at the first landing of STR-1. From the floor level of the courtyard, the first landing rises to a height of 25 cm with square pillar bases arranged in a row along its eastern periphery. The northern and southern walls of this level contained shallow niches framed by ornate plasters comparable with those of 'Rangamahal' exposed in the Mint encloure *(1979-80,* p.33). The bust of a female figure, head of a male figure wearing a decorated *kirita* and other decorative motifs retrieved from the debris near the niches suggest that these niches once accommodated beautiful stucco figures.

The second landing rises to a height of 0-55 m over the first. The two levels are differentiated by a moulded *adhisthana.* The landing has a centrally positioned, lime plastered, single flight of steps. Four pillar bases placed in a row are traced adjoining the *adhisthana.* One of them is provided with a peripheral iron ring. This level is a 'U' shaped courtyard formed by 'L' shaped platforms on the north and south with usual *adhisthana* mouldings. The platforms are intercepted by a passage leading to a plastered squarish courtyard on the west. They are reached by flight of three steps provided at the northern and southern corners. The flight of steps on the north has a stucco balustrade on the south whereas the southern one has similar balustrade on the north. The steps are covered with lime plaster.

The 'L' shaped platforms accommodate square and rectangular rooms which have ornamental corners and side pilasters of brick and lime. The squarish courtyard on the west is surrounded by moulded *adhisthana* supporting verandahs on south and north-east. On the west, there is a long corridor into which open up three rectangular rooms through entrances provided on the east. The balustraded flight of two steps provided at the southwestern corner leads to the corridor. This courtyard has another passage flanked by rectangular rooms at its northern end and leads to STR-2 on the north. There is only one room to the west of the passage whereas there are two such rooms to the- east.

Almost the entire floor area of this structure contained debris comprising charcoal mixed with ash superimposed by beautifully executed stucco designs, brick-bats and chunks of plaster and lime concrete besides a variety of iron nails. An analysis of the debris accumulated indicates that the structure probably had profusely decorated interior surfaces with lime concrete roof supported by columns, beams and rafters of timber and extensive burning activity brought it to ruins.

A scrutiny of the plan of this structure (STR-4) suggests that it was a place of distinction in the whole complex. This view is further substantiated by the absence of entrances directly leading to the structure except through sham entrances or well guarded entrances connecting it to either STR-1 or STR-2 both located on the north of STR-4.

Excavation in the current season revealed a systematic network of tanks and interconnected channels, which ensured continuous water supply to the complex. Altogether four tanks were constructed at different levels to collect water and a squarish chamber-like tank located at a strategic point to regulate the flow of water are laid bare. Significantly, all the structural activities connected with the hydraulic system is concentrated in the southern and western parts of this layout.

The tanks, mostly constructed of cut-stone masonry set in lime mortar are repeatedly plastered on their inner surfaces. Two of the tanks are constructed abutting the massive enclosure wall and utmost care is taken to avoid or minimise the spillage of water. The water channel on the southern side is cut into the natural bed-rock along the periphery of STR-4, effectively utilizing the natural gradient of the rock surface. At places where the bed-rock was not found suitable, the channel was built of rubble masonry set in lime mortar. Concealed terracotta pipes were also used as water carriers at some places. The channels are invariably lime plastered repeatedly.

The shallow rectangular (7.80 X 3.94 m) tank (T-l) exposed about 20 m west of STR-4 is constructed in size stone masonry. The 0.80 m deep tank has an inlet on the south-east. Water of this tank was supplied through a water carrier entering the complex at the southeastern corner through the periphery of STR-4 in east-west direction. It has three outlets, one on the south-west and the rest on the northern side. The outlet on the south-west provides water to the tanks on the west and north. The two outlets on the north are provided at different levels. One of them diverts towards north and the other towards west.

About 5 m further west of the above tank another 1.5 m deep squarish (3.40 X 3.20 m) tank (T-2) was exposed at a slightly lower level. This tank, fed by a channel from T-l, inturn, supplied water through sub-channels at a lower level towards south and west.

Another rectangular tank (T-3) (4.90 X 4.20 m) of similar type was exposed further north of these two tanks at a distance of 25 m, located between the inner and outer cyclopean walls of the enclosure on the western side. Evenly spaced, peripheral rectangular pilaster-holes suggest that the tank had a roof. A single flight of steps provided on the southern side leads to the peripheral catwalk of the tank. There is a flight of three steps on the east leading to the water level of the tank. Extant evidences indicate that water used to flow into the tank from the southern inlet and the circular hole provided on the southwestern corner, obviously, formed part of the depletory mechanism. To the west of T-3 and on the east of the Rock-cut temple is a squarish chamber. This chamber has a complex network of interconnected channels diverging from it in different directions and at different levels. The low level outlets were probably meant for supplying water to different structures located further north and west of this chamber.

Further excavation in the periphery of the structural complex revealed portions of a massive enclosure wall encompassing all the structures, including part of the water supply system. This enclosure wall has a uniform width of 1.35 m and is extant to a maximum height of 3.50 m at the southwestern corner. It is much disturbed at the northern side where it comprises only two courses to a height of 0.90 m. The eastern enclosure wall has a rectangular chamber (4.50 X 4 m) abutting it on the west at its northern end. In-between the outer enclosure wall and the structures, there are spacious courtyard on the east and the north.

The antiquities retrieved from the excavation include a gold wristlet; a miniature Ganesa in stone; copper sheet ornament and coins, iron arrow-heads, knobs, nails and linch pins; beads of crystal and other semiprecious stones and terracotta, besides, glass and bangle pieces. Fragmentary stucco figures like human figurines (pl. XV), animals, birds (pl. XVI A), *kudu* motifs, merlons, floral and pendant motifs (pl. XVIB) were also encountered. Miniature Ganesa sculptures, *Siva-lingas* and a pedestal in basalt are among the important antiquities.

The terracotta conical seal, with a roughly circular base (1 .70 X 1.6 cm) found within the open courtyard located east-south-east of STR-3 in black colour contains three registers in the lower surface. The upper register bears part of a hiked sword positioned upside down and is flanked by partly extant symbolsofsuntotherightandcrescentmoonontheleft.Thesecondandthirdregistersincorporateamuch worn-out legend in *nandinagari* script of medieval characters. The text reads: *(sr) i Vir (u) (pa) ksha.*

A Chinese coin (2.5 cm X 0.01 cm) with a squarish (0.5 X 0.5 cm) hole at the centre was unearthed near the northern main entrance to the Mint enclosure. The obverse bears a legend in four Chinese characters arranged at 3, 6, 9 and 12 hours position of the clock. The reverse is however, blank.

The ceramic industry is represented by the occurrence of plain and decorated medieval black ware and red ware, few of them burnished. Only a few sherds of Chinese porcelain were encountered. The common shapes include lamps, a variety of shallow and deep bowls, carinated cooking and serving vessels of medium size and large storage vessels with globular profile and constricted neck besides a number of conical lids invariably of black ware.

33. EXPLORATION IN TALUK SANDUR, DISTRICT BELLARY.— W.V.S. Narasimhan of Bangalore Circle of the Survey brought to light following antiquarian remains during the course of his village-to-village survey in the Sandur taluk of Bellary district.

Village	*Nature of remains*
Chikkakereyaginahalli (15"57' 15"; 76° 25' 00")	Stone inscription (Kannada) AD 1569, two hero-stones, four loose sculptures of medieval period
Dharmapura (14°4'00";76°33'00[11])	Gandi Narasimhaswamy temple of eighteenth-nineteenth century
Hulikunta (15° 00' 00"; 76° 23' 30")	Stone inscription (Kannada) and Sri Balakrishna temple (AD 1556); bas-relief of Veerabhadra in a shrine

Village	*Nature of remains*
Kartikeswara (Subramanyahalli or Swamihalli) (15°01'30"; 76°34'00")	Kumaraswamy and Parvati temples with inscription and loose sculptures in the vicinity of these temples (early medieval period). Two brick walls in the section of the small stream at Jogikolla (early historical period) and three loose sculptures in two caves (medieval)
Lakshmipura (or Chikkasandur) (15°33'00"; 76° 33'00")	Square platform having three mouldings, few architectural members, eroded stone inscription and hero-stone (medieval period)
Sandur (15°5'00";76°33'00")	A stone inscription (Kannada) of medieval period, Vithoba and Saiva temples of eighteenth century
Yashwantanagar (15°02'00";76°30'30")	Stray microliths, hero-stone and three loose sculptures (medieval period), three dressed slabs with bas-reliefs and a stone inscription (late medieval period)

34. EXPLORATION IN DISTRICT BIJAPUR.— H.T. Talwar of the Directorate of Archaeology and Museums, Government of Karnataka during the course of exploration noticed the following cultural remains.

Taluk	*Village*	*Nature of remains*
Badami	Allur	Inscription and Ganesa (eleventh-twelfth century)
	Asangi	Erotic sculpture (eleventh-twelfth century)
	Haldur	Nandi (thirteenth century), Gaja-Lakshmi and hero-stone (eleventh-twelfth century)
—do—	Injanavari	Anjaneya of fourteenth century
—do—	Kotnalli	Mantapa and Nandi (fourteenth century)
—do—	Layalgunda	Bastion (eighteenth century) Bastion
Hungund	Huvinahalli	(eighteenth century)
	Mullur	Ganesa, *Sapta-matrika* panel and Mahishasuramardini (twelfth century)

Taluk	*Village*	*Nature of remains*
Hungund	Nimbalaguna	Chalukyan temple, pillar in Hanuman temple, Ganesa and Mahishamardini (eleventh-twelfth century) and Anjaneya (fourteenth century)

35. EXPLORATION IN TALUK HIREKERUR, DISTRICT DHARWAD.— T.M. Keshava of Bangalore Circle of the Survey noticed the following antiquarian remains in Hirekerur taluk of Dharwad district, during the course of village-to-village survey.

Village	*Nature of remains*
Aladkatti (14°29'04";76°23'36")	Temple of sixteenth century
Apinkop (14°33'26";75° 19'22")	Temple of sixteenth century
Arikatti (14°30'42";75°21'18")	Hero-stones of twelfth century and temples of sixteenth century
Balambid (14°27' 32"; 75° 22' 56")	Temple of Visapariharesvara of eleventh century
Bannihatti (14°22'40";75°24'50")	Sari-stones of twelfth century and temple of sixteenth century
Bellur (14°22'00";75°26'46")	Loose sculptures of Madanika and Srinivasa of twelfth century and temple of sixteenth century
Betkerur (14°31'42"; 75° 20'06")	Temples (twelfth to fourteenth century)
Chikkerur (14°31'42"; 75° 18'29")	Bipesvara temple of AD 1082, a ruined temple, hero-stones, inscriptions and sari-stones of twelfth century
Damhalli (14°30' 10"; 75° 20'54")	Temples (twelfth-sixteenth century)
Dasankop (14°34'16";75°20'00")	Temples (twelfth-sixteenth century)
Ingalgondi (14°26'00";75°26'30")	Kallesvara temple of eleventh century and *gosasa* pillars of ninth century
Havasbhavi (14°33'40"; 75° 21'30")	Two temples (twelfth to sixteenth century); loose sculptures of Ganesa, caprisoned elephants, torso of a deity, *sati* and hero-stones of twelfth century

Village	*Nature of remains*
Hirekerur (14°27' 30"; 75° 23' 54")	Temples (twelfth to sixteenth century); loose sculptures of Surya, ascetic, *Siva.-linga, naga-stones,* sari-stones and *gosasa* pillars ranging in date from ninth to twelfth century
Hiremattur (14°29' 30"; 75° 27' 24")	Temples and sari-stones of twelfth century
Hireyadchi (14°25' 50"; 75° 26" 12")	Inscribed hero-stones of twelfth century
Hoshalli (14°26'52";75°26'30")	Temple of twelfth century Temple of
Kachavi (14°35' 18"; 75° 15' 16")	sixteenth century Temple of sixteenth century
Kalgond (14°29' 10"; 75° 25'24")	Sari-stones of twelfth century and a temple of sixteenth century
Kargi (14°32'56"; 75° 21° 29")	Two temples (twelfth to sixteenth century); sculpture of Ganesa, eighth century
Kod (14°31'12";75°26'48")	Temple, loose sculptures of Parsvanatha, Tirthankara, sari-stones and hero-stones of twelfth century
Kunchur (14° 31' 00"; 75° 30' 04")	Temple of twelfth century
Mattihalli (14°33'00";75°20'18")	Highly disturbed early historic mound, temple and *sati* stones of twelfth century
Nidnegal (14°23' 30"; 75° 23' 42")	Temple, inscriptions and sari-stones of twelfth century
Nittur (14°34'00";75° 16'40")	Temple, loose sculptures of *Sapta-matrikas,* sari-stones, Nandi and hero-stones of twelfth century
Nulgeri (14°30'50"; 75° 24'54")	Palaeoliths of lower and middle phases on quartz and chert, temples and loose sculptures of Brahma, Mahavira, Parsvanatha, hero-stones and inscriptions of twelfth century
Rattihalli (14°05'00"; 75° 01'00")	Temples of Ramalingeswara (tenth century), Shantes-wara (twelfth century), Sankaranarayana (AD 1241) and Harihareswara (AD 1204)
Satenhalli (14°34' 54"; 75° 18'08")	

Village	*Nature of remains*
Shiragambi (14°25' 32"; 75° 28' 08")	Early historic site, *gosasa* pillars of ninth century and *sati* stones of twelfth century
Shriramankop (14°32'34";75°22'24")	Temples of sixteenth century
Tavargi (14°27'28";75°26'00")	Hero-stones of twelfth century
Totaganti (14°04' 15"; 75° 01' 15")	Rolled implements of lower middle palaeolithic periods on quartz and chert, temple of sixteenth century
Vadinkatti (14°26'40";75°24'56")	*Sati-stones* of twelfth century
Varaha (14°23' 26"; 75° 22' 22")	Temple, sari-stones and hero-stones of twelfth century
Yedgod (14°03' 15"; 75° 02'32")	Mound of early historic period
Yemmignur (14°33'48";75° 14' 10")	Temples and hero-stones of twelfth century

36. EXPLORATION IN TALUK CHINTAMANI, DISTRICT KOLAR.—P.S. Sriraman of the Bangalore Circle of the Survey has brought to light the following antiquarian remains during the course of his village-to-village survey.

Village	*Nature of remains*
Kaivara (13°20' 42"; 78° 00' 15")	Extensive habitation mound yielding pottery from neolithic period and temples of medieval period
Kurbur (13°18' 12"; 78° 04'52")	Extensive megalithic burial site and loose sculptures
Nernakallu (13°18' 12"; 78° 12' 15")	Early historical habitation site
Sikallu (13°21" 18"; 78" 35" 08")	Memorial stones of post-Vijayanagara period

37. EXCAVATION AT TALKAD, DISTRICT MYSORE.—The Directorate of Archaeology and Museums, Government of Karnataka, under the guidance of D.V. Devaraj in collaboration with A.V. Narasimhamurthy and M.S. Krishna Murthy of the Department of Ancient History and Archaeology, University of Mysore conducted Archaeological excavations at Talkad.

The excavation revealed Megalithic pottery besides, ivory objects, shell ornaments, terracotta figurines, beads of semiprecious stones, varieties of pottery of Satavahana period including Kaolin painted ware and iron objects, etc.

A huge ruined brick structure (60' X 75') identified as a Jaina *basadi,* datable to about seventh-eighth centuries AD was exposed in the excavation. The structure consists of three cells in a row with a verandah and a porch in front. This was enlarged around AD 1000 by constructing a separate stone *adhisthana* and an enclosure wall. The structure which appears to be a shrine was perhaps deserted during the Vijayanagara period of which only the remains of the huge brick walls and platform are extant.

Besides the pottery, terracotta and semiprecious stone beads, *hukka* piece and a few remains of structures particularly the terracotta ring-wells, etc., of Chola, Hoysala and Vijayanagara periods were also found in large number (pl. XVII).

A kiln made of mud and filled with ash was also exposed. The kiln has a small hole on one side to fix the blow pipe from the bellows. Small terracotta crucibles, lumps of ash were found strewn around the kiln. Just by the side of the kiln was discovered a terracotta coin mould (pl. XVIII A), bearing impression of the reverse side of a Roman coin. The mould (2.5 cm X 5 mm) bears the representation of lady Livia or Justitia, seated, holding in her left hand a sceptre and in the right, ears of corn. Two sides of the figure have the legend *Maxim Pont* (IF) which literally means the Head priest.

Besides a magnificent stone sculpture of Mahishamardini with Pallava influence, datable to *circa* seventh century found buried in a canal at Talkad-the ancient Ganga capital (pl. XVIII B).

38. EXPLORATION IN DISTRICT NORTH KANARA.— The Prehistory Branch of the Survey under the direction of A.K. Sharma, assisted by P.V. Janardhanan, C.L. Yadav, Ghayasuddin, P.C. Dogra explored the following sites.

A large number of Early Stone Age tools were collected from Jukheri (14°49'; 74° 10') on the left bank of Kali Nadi from the slopes of a hill, 10 km east of Karwar. The tool types include handaxes and scrapers, most of which are highly weathered.

Two temple sites were located in the out skirts of the village Bhaire (14° 59'; 74° 22') which is on the right bank of Kali Nadi. One of these temple remains show only the plinth which appears to be circular in plan, measuring 11 m in diameter and is made of dressed lateritic blocks. Apart from this a large number of sculptures including those of the tribal deity were located in deep jungles on both banks of Kali Nadi. The outskirts of the villages which yielded these sculptures are Marathwadi, Hankon, Gotagalli and Wailvada.

Apart from this a neolithic site was located at Anshi (14° 59' ; 74° 22') on the road from Sadasirgarh to Belgaum at a height of 2300 ft to the north of the present village. On closer examination the plans of some structures made up of lateritic rubbles were located. One round depression was noticed on the hardened lateritic floor within the complex. The mound of this depression is 15 cm in diameter and is abraded, probably due to use. Shale as raw material for fabricating Neolithic tools is

exposed on the bank of a rivulet which flows near the river. From this area two broken pieces of Neolithic tools were located. Mound is partially destroyed due to highway construction which passes close to the site.

39. EXPLORATION IN DISTRICT NORTH KANARA.— L.S. Rao, assisted by S.K. Lekhwani, S.S. Gupta, N. Taher, K.M. Girhe, Mala Suple, N.K. Nimje, P.S. Pashine, Ghayasuddin, P.C. Dogra and T.B. Thapa of the Prehistory Branch of the Survey conducted investigations of prehistoric sites in the west coast region. The area lying in-between Karwar in north and Bhatkal in south was intensively surveyed.

The investigation revealed that the Mesolithic and Neolithic artefacts occur on top of the lateritic hills at a height of 100 to 400 ft M.S.L. The artefacts of Mesolithic period include points, scrapers, borers, flakes, blades, cores, fluted cores, etc. Out of the finished artefacts points predominate. All the artefacts are invariably fabricated on milky quartz. Sometimes, they show a sign of brown patination which is due to their association with primary laterite. A few Neolithic celts and a macehead made on trap were also recovered from the same horizon (pl. XVIII C).

Besides these, temples of medieval period were also noticed in the area.

The following are the sites belonging to various cultural periods located during the course of investigations.

Taluk	*Village/Site*	*Nature of remains*
Ankola	Belakeri	Mesolithic artefacts
	Bhavikeri (14° 41'; 74° 16'45")	Mesolithic artefacts
	Hausa (14° 43'45"; 74° 17')	Mesolithic artefacts
	Kanchibail (14° 42" 15"; 74° 32' 30")	Mesolithic artefacts
	Shirgunji (14° 37'45"; 74° 25'30")	Mesolithic artefacts
	Sulerbail (14° 39'; 74° 24'30")	Mesolithic artefacts and early historic pottery
Bhatkal	Maranaballi (13° 54'30"; 74° 35'30")	Medieval temple remains
	Sabati (14° 00' 16"; 74° 35' 30")	Medieval Siva temple
	Tallan (13° 54'15"; 74° 34'30")	Mesolithic artefacts
Gokaran	Andle (14° 35'30"; 74° 23'30")	Medieval *Si\Si-linga*

Taluk	*Village/Site*	*Nature of remains*
Gokaran	Gokaran (14°32'30";74°19'30")	Mesolithic artefacts
—do—	Mudangi (14°32'15";74°21'00")	Mesolithic artefacts
Kumta	Harnit (14°22'30";74°25'30")	Mesolithic artefacts
—do—	Kumta (14°25'30";74°24'30")	Mesolithic and Neolithic artefacts
—do—	Mirjan (14°29'45";74°26"45")	Mesolithic artefacts and rock-shelter
—do—	Nilakonda (14° 29' 30"; 74° 27' 30")	Neolithic artefacts

40. EXPLORATION IN TALUK SORAB, DISTRICT SHIMOGA.— In continuation of previous year's work *(1991-92,* pp. 48-52) hundred and three villages were explored in Sorab taluk of Shimoga district by C.S. Seshadri of Bangalore Circle of the Survey. Of these the important ones are as under.

Village	*Nature of remains*
Ankaravalli (14°23'48";75°00'15")	San-stone
Bairekoppa (14°06' 12"; 75° 20' 27")	Medieval habitation site, inscribed hero-stones and *sati* stones of twelfth century
Bankasana (14°34' 07"; 75° 04' 52")	Mound yielding laterite bricks, inscriptions and hero-stones of twelfth-fifteenth century
Basur (14°03'23";75°03' 18")	Inscriptions and hero-stones of fifteenth century
Bharangi (14°15' 18"; 75° 33' 23")	Jaina *basti,* temple, loose sculptures, inscribed hero-stones and sati/-stones (eleventh-twelfth century)
Bilagi (14°24' 13"; 75° 05' 08")	Inscriptions of ninth-tenth century, loose sculptures of Vishnu, Mahishamardini, Surya, Ganesa and inscribed hero-stone of sixteenth-seventeenth century
Bommanahalli (14°26' 28"; 75° 04' 45")	Sar/-stone and loose sculptures of Nandi, Ganesa and *Sapta-matrika* of Vijayanagara period
Chikkachavati (14°12' 19"; 75° 34'41")	Inscribed hero-stones of twelfth century AD and *sati* stones

Village	*Nature of remains*
Chiksakuna (14°23'12";75°05'42")	Loose sculptures of *Sapta-matrika,* Ganesa, Nandi and soft-stone of fifteenth-sixteenth century
Chitrattihalli (14°24'48";75°05'00")	Siva temple of post-Vijayanagara period, inscription, hero-stone of twelfth-thirteenth century
Doravalli (14°08'31";75°37'12")	Inscribed hero-stones, raft-stones, loose sculptures of *Sapta-matrika,* entwined *naga* and Gaja-Lakshmi panel of tenth-eleventh century
Dyavanahalli (14°20' 34"; 75° 03' 25")	Inscribed hero-stone of eleventh-twelfth century, loose sculptures of Nandi and Yaksha of post-Vijayanagara period
Ginivala (14°15' 38"; 75° 35' 12")	Inscriptions and hero-stone of twelfth century
Gudavi (14°27' 12"; 75° 00' 38")	Inscribed hero-stones of eleventh century, sati-stones and loose sculpture of Ganesa of Vijayanagara period
Halagalale (14°01^{1}15";75°06'48")	*Sati-stones,* loose sculpture of Uma-Mahesvara and *Sapta-matrika* fifteenth century
Hallada Bennigere (14°16'35";75°36'14")	Temples, loose sculptures of Ganesa, *Sapta-matrika,* Nandi and inscriptions of eleventh-twelfth century
Haralikoppa (14°34'07"; 75° 11'05")	San-stones of fourteenth-fifteenth century
Heggodu (14°09' 38"; 75° 21' 14")	Inscribed *sati-stones* of twelfth century
Hechi (14°23' 15"; 75° 58' 12")	*Dvikutachala* temple of post-Vijayanagara period, loose sculptures of Ganesa, Virabhadra, Vishnu, Nandi, *Sapta-matrika,* inscribed hero-stones, inscriptions and *Sati* stones of twelfth-thirteenth century and medieval fort
Hirechavati (14°13' 12"; 75° 34' 18")	Post-Vijayanagara temple, loose sculptures of Ganesa, Nandi, *Sapta-matrika,* Mahishamardini, inscribed hero-stones and sati-stones assignable to twelfth-fifteenth century
Hosur Agrahara (14°28' 13"; 75° 01'12")	Inscribed hero-stone of thirteenth century
Hultikoppa (14°23'29";75°00'45")	Loose sculptures of Vijayanagara period

Village	*Nature of remains*
Hunasikoppa (14°29'48";75°03'15")	Hero-stone *and sati-* stone of fourteenth-fifteenth century
Hunavalli (14°11' 18"; 75° 17 38")	Temple, inscribed hero-stones and *sati*-stones assignable from ninth to fifteenth century
Hurli (14°11' 42"; 75° 34" 12")	Temples, inscriptions, loose sculptures of Ganesa, *Sapta-matrika,* Surya and inscriptions assignable from twelfth to fifteenth century
Hurlikoppa (14°11'39";75°35'12")	Architectural member inscribed in twelfth century Kannada characters
Jeddihalli (14°30'45";75°03'20")	Inscribed sari-stone and hero-stone of eleventh-twelfth century
Jembehalli (14°24' 14"; 75° 23'00")	Inscription of ninth century, inscribed hero-stone of fifteenth-sixteenth century and Durga temple of post-Vijayanagara period
Jimanur (14°07' 18"; 75° 20' 17")	In scrip tion, *sad-* stone and heto- stone s of twelfth century
Kaisodi (14°07'45";75° 15'08")	Loose sculptures of Vishnu, Mahishamardini, *Sapta-matrika* and Ganesa of fifteenth-sixteenth century
Kallambi (14°26'23"; 75'01'52")	Sari-stones and hero-stone of eleventh-twelfth century
Kannur (14°10' 13"; 75° 17'31")	Inscribed hero-stone and sari-stone of twelfth century
Kasavadikoppa (14°11' 13"; 75° 21'34")	Saw-stone of thirteenth century
Kattinakere (14°08" 18"; 75° 17'45")	Loose sculptures of Ga/a-Lakshmi and Ganesa of twelfth century
Kerehalli (14°31' 15"; 75° 04' 38")	Inscribed hero-stone and sari-stone of tenth-eleventh century
Kodikoppa (14°33'45";75°08' 17")	Loose sculpture of Nandi
Kolaga (14°28'31"; 75° 03'43")	Hero-stone and sari-stone of fifteenth-sixteenth century

Village	Nature of remains
Kolisali (14°06’ 12"; 75° 17' 09")	Inscribed hero-stone of seventeenth century
Koragodu (14°26' 15"; 75° 05" 10")	Inscribed hero-stones and loose sculpture of Ganesa of twelfth century
Kulavalli (14°09' 18"; 75° 20' 17")	Inscribed and uninscribed *sati*-stones of eleventh-twelfth century
Kumbatti (14°09' 14"; 75° 20'19")	Inscribed hero-stone and *sad*-stones of eleventh century
Kummur (14°24' 42"; 75° 04' 53")	Inscribed hero-stone and *sad-stones* of fourteenth -fifteenth century
Kundaragalali (14°24' 38"; 75° 04' 12")	Sari-stones, hero-stones, loose sculptures of Mahishasuramardini, Ganesa, Nandi and Narasimha of post-Vijayanagara period
Kuppe (14°06'45"; 75° 29' 18")	Inscribed hero-stone of twelfth century, loose sculptures of Rama, Sita, Lakshmana, Hanuman and *Sapta-matrika* of post-Vijayanagara period
Lakkavalli (14°07' 19"; 75° 35' 10")	Inscribed hero-stone and *sad-stone* of eleventh century
Malagi Kurli (14°25'48";75°06'48")	Siva temple, inscribed hero-stones, *sad-stones,* loose sculptures of Mahishamardini and Ganesa of eleventh-twelfth century
Muguru (14°07' 37"; 75° 36' 05")	Loose sculptures of Varaha, Ganesa, inscribed *sad* stones and hero-stones of twelfth century
Nittakki (14°30'03";75°05'38")	Inscribed hero-stones and san-stones of twelfth-thirteenth century, loose sculptures of Ganesa and Nandi of post-Vijayanagara period
Ottur (14°25'00";75°06'38")	Siva temple, architectural members, inscribed hero-stones, loose sculptures of Surya and Uma-Mahesvara assignable to twelfth-thirteenth century
Pura (14°09' 17"; 75° 17" 35")	Siva temple, inscribed hero-stones, loose sculptures of *Sapta-matrika,* Mahishamardini and Vishnu (twelfth-fourteenth century)
Puttanahalli (14°30'42";75°04'25")	Inscription, *sad-* stone, loose sculptures of *Gaja*-Lakshmi and architectural members of thirteenth-fourteenth century

Village	*Nature of remains*
Sagadde (14°06' 12"; 75° 18' 19")	Siva temple, loose sculptures of Ganesa, *Sapta-matrika,* Nandi and inscribed hero-stone of eleventh-twelfth century
Sarekoppa (14°26" 55"; 75" 03' 15")	Inscribed hero-stones of twelfth century
Sigehalli (14°25'41";75°33'15")	Inscribed hero-stone and loose sculpture of Mahisha-mardini of twelfth century
Sigga (14°11'37"; 75° 18'07")	Inscriptions, inscribed hero-stone from ninth-tenth century
Talaguppe (14°30'51";75°05'21")	Painted wooden box of eigthteenth- nineteenth century
Tavanandi (14°27' 15"; 75° 04'48")	Medieval fort, loose sculptures and hero-stone
Talagadde (14°36'08";75°05'38")	Temples, loose sculptures of Shanmukha, *Chauri-bearer,* Mahishamardini, *Gaja*-Lakshmi and Nandi of tenth-eleventh century; medieval fort
Tumrikoppa (14°37° 12"; 75° 04' 35")	Inscribed and uniscribed hero- stones of eleventh-twelfth century
Ulvi (14°07" 45"; 75° 16'08")	Sari-stone and erotic sculptures of post-Vijayanagara period
Yakshi (14°27'33";75°05'25")	Loose sculptures of Ganesa, Nandi, Mahishamardini, *yaksha* and sari-stone of fifteenth-sixteenth century
Yelasi (14°22'30";75°02'30")	Inscriptions, hero-stones, sari-stones, loose sculptures of *Yaksha,* Narasirnha and Vishnu of eleventh-twelfth century
Yelavala (14°15'07";75°34'12")	Remnants of a brick (40 X 22 X 9 cm) structure, temple, loose sculptures of Surya, *Sapta-matrika,* bracket figures and hero-stones of twelfth century

41. EXPLORATION IN DISTRICT UTTARA KANNADA.— K.G. Bhatsoori of the Directorate of Archaeology and Museums, Government of Karnataka in the course of village-to-village survey in Kumta taluk of district Uttara Kannada discovered the following sites of archaeological interest.

Village	Nature of remains
Bastikeri	Tirthankara (twelfth-thirteenth century), hero-stone (eighteenth century)
Haralli	Hero-stone, eighteenth century
Harodi	Hero-stone (seventeenth century)
Hosal	Venugopala (eighteenth-nineteenth century)
Jullurmatha	Ganapati (eighteenth century)
Marbhaga	Hero-stone (eighteenth century)
Mirjan	Medieval fort, hero-stone, Mahishamardini
Mudhahalli	Nandi, thirteenth century
Murur	*Siva-linga* of seventeenth century, sculptures of Vishnu (fifteenth-sixteenth century) and Nandi (eighteenth century)
Santgal	Hero-stone, twelfth century
Talgod	Janardana temple (fifteenth-sixteenth century)
Urkeri	*Siva-linga* (eighteenth century)

MADHYA PRADESH

42. EXPLORATION IN DISTRICT BALAGHAT.— The Prehistory Branch of the Survey under the direction of A.K. Sharma, assisted by K.M. Girhe, C.L. Yadav, Ghayasuddin, P.C. Dogra and V.R Kulkarni discovered two caves at Bhadrasur (21° 23'; 80° 36') and one at Gadhmata. These caves are located to the north of Kachargad caves between Risewada and Sitapala village at the height of 552 m.

The cave at Gadhmata opens to the south, is 15 m long in north-south orientation. The width at the mouth is 4 m with the maximum height being 2 m. The cave is now used as a shrine by local Gonds and has an ashy deposit of nearly 0.30 to 0.35 m.

The other two caves known as Bhadrasur caves are located to the north of the cave at Gadhmata. The bigger one is 6 m in length, 4 m in width and 2 m in height. The other cave is to the east of the previous one and is 4 m long, 2 m wide and 1-60 m in height. All these caves open to the south.

43. EXPLORATION IN DISTRICT RAIGARH.—The Prehistory Branch of the Survey under the direction of A.K. Sharma, assisted by R.K. Dwivedi, Mala Suple, Ghayasuddin, P.C. Dogra and R.G. Katole explored the region and located a number of sites.

Rock-shelters, Early and Middle Stone Age sites were located at Manikpur (21° 34'; 83° 08') in tehsil Sarangarh, 6 km south of Sarangarh on Raigarh-Saraipali road by the side of an ancient tank which

has been constructed over a natural spring runs the Madalia Dongar, 978 ft high. Rock-shelters are located on the eastern face of the hill, which are of low and medium height. In front of the rock-shelters and on top of the hill, Early and Middle Stone Age tools are lying scattered. The raw material used for artefacts is of fine grained sandstone. Presence of finished and unfinished tools and heap of flakes are indicative of the factory site. The tools comprise of mostly the handaxes, choppers and scrapers. As the tools are found just in front of the rock-shelters, it appears that these shelters were used by the Early Man as temporary resting places.

The village Bartia Bhata(21° 22'; 82° 55'), situated in tehsil Saraipali nearly 16 km north of Bana on Bana-Sagarpali road was inspected, where a cluster of nearly 600 - 700 menhirs were found located just to the west of the village. As the road panes over a part of the site, large number of menhirs have been covered by the road. All the menhirs which are from 1 to 1.5 m tall, have been erected in east-west direction with the dressed surface facing east. This is in total departure from the normal practice of erecting megaliths in north-south direction. There are no cairn heaps and circles around the menhirs. They appear to have been dressed in the form of anthropomorphic figures, particularly in the eastern face. The source of raw material is the twin hill known as Mama-bhanja hills, located nearly 2 km north of the present site. Most of the menhirs have been carved out of granite blocks with one or two on sandstone. It was gathered from the villagers that during the excavation for laying road and construction of hostel building large quantity of iron objects like daggers, spearheads, knives and arrowheads were recovered from the site. Morphologically these menhir clusters resemble those found in north-east India. Thus they assume importance as they may establish a cultural link of central India with northeast India during Megalithic times, i.e., around 1000 BC.

An ancient mound surrounded by a huge moat nearly 30m wide has been located at Bhanwarpur (21 °22'; 82° 55') in tehsil Saraipali. The site is presently used as a local weekly market place. Apart from this mound, two other ancient mounds with structural remains of stone have been discovered at Rajim (20°57'; 81° 53') in tehsil Gariband which are within the complex of Rajivlochan temple of historical period. These structural remains are visible because of extensive erosion of the mound by the river. Another fortified historical site with a double moat at village Pirda (21°22'; 82° 45') has been located about 12 km north of Basna, on Basna-Bilagarh road. The entire site here is 542 m in radius. The central mound is 140.50 m wide from where as per information from the villagers, copper and gold coins were found. The mound is surrounded by 28 m wide inner moat. The outer moat is 34 m wide. The area between the outer and inner moat is littered with pottery and structural remains. Four mud bastions, one each in each direction measuring 25 m in circumference, project out from the inner arm of the outer moat.

Apart from historical sites, a medieval fort known as Garh Phuljhar (21° 13' ; 82° 51'), a habitational mound and two tanks were discovered in tehsil Saraipali. The fort, taking advantage of a small hill and topography of the area, is constructed of boulder masonry and dressed stones. It has two entrances and four bastions. The two tanks are located one each in the north and south direction where the two entrances open. The northern entrance which has steps of 2 m wide, leads to the fort in a zigzag fashion. The southern entrance of the fort is 3.40 m wide. The gate of the fort is constructed of burnt-

bricks of 25 x 18 x 9 cm in size on which *lakhauri* bricks are utilized to maintain proper level. At the centre of the fort is the highest point of the hill where a platform has been constructed.

44. EXPLORATION IN DISTRICT RAJNANDGAON.— The Prehistory Branch, Nagpur of the Survey under the direction of L.S. Rao, assisted by C.L. Yadav, P.C. Dogra and P.D. Satpute identified a Palaeolithic site (21° 14'; 80° 39') on the right bank of a seasonal *nullah* located at the northern fringe of the village Kurajhar in tehsil Dongrargarh. The tool assemblages from this site comprise handaxe and cleavers made on basalt.

45. EXPLORATION IN DISTRICT RAJNANDGAON.— The Prehistory Branch, Nagpur of the Survey, under the direction of A.K. Sharma, assisted by K.M. Girhe, C.L. Yadav, Ghayasuddin, P.C. Dogra and V.R. Kulkarni discovered a cave and a rock-shelter at the site Ponda-Dongri (21 "07'; 80° 36'). Ponda-Dongri hill is located between Bagrakasa and Pitepani village on Sadak-Chirchari to Bortalao road. The rock-shelter has now been converted into a shrine by the local Gonds. The cave is still undisturbed and has ashy deposit of 0-30 to 0-35 m with a perennial *nullah* flowing nearby.

MAHARASHTRA

46. EXCAVATION AT BHAWAR, DISTRICT BHANDARA.— The Excavation Branch I of the Survey, under the direction of Amarendra Nath, assisted by N.C. Prakash, S. Prathapachandran, Ch. Babjirao, N.K. Sharma, H. J. Baraparre. D.K. Kasbi, R.G. Nagulwar and S.M. Khairkar carried out trial excavation at Bhawar (20° 52'; 79° 44'), taluk Pauni. The site is situated on the left flood plains of the Wainganga drainage system; a seasonal stream locally known as Somnala meanders around it, maintaining a gentle slope towards southeastern direction.

The archaeological relics at the site may broadly be classified in two groups namely the clusters of burial sites in the form of stone-circles and the habitation mound. A major portion of the latter is covered by modren habitation while its peripheral region is under systematic destruction by some local brick manufacturers. Likewise, some of the stone-circles have also suffered losses in the process of widening of roads and expansion of agricultural activities. Leaving aside an isolated example of the eastern side of the habitation mound, there are two groups of stone-circles on the northern side of the village divided by a road leading to Pipalgaon (20° 53'; 79° 44') — another megalithic site of the neighbourhood (pl. XIXA; fig. 8). On an average the diameter of the circles of the eastern side of the road (Group B, comprising thirteen circles) varies anywhere between twenty-four metres and eleven metres in diameter while the circles on the western side of the road (Group A, comprising twenty-one circles) ranges from fifteen metres to eight metres in diameter. Basing on these measurements it is assumed that Group B formed the cluster of burials of some important dignitaries. The burial 7 and 9, largest of the lot, occupy an important place in the Group with a deposit of over a metre from surrounding plains. These two, on the surface observations, may reasonably fall in the category of cairn-circle while some may be categorized as pit-circle with cairn.

The trial excavations carried out on the western slope of the habitation mound was with a view to know the cultural sequence of the site and its correlation with the key sites of the region like Pauni *(1968-69,* pp. 14-16; *1969-70,* pp. 20-21) and Adam *(1988-89,* pp. 50-67; *1989-90,* pp. 58-59; *1990-91,* pp. 43-45; *1991-92,* pp.63-68).

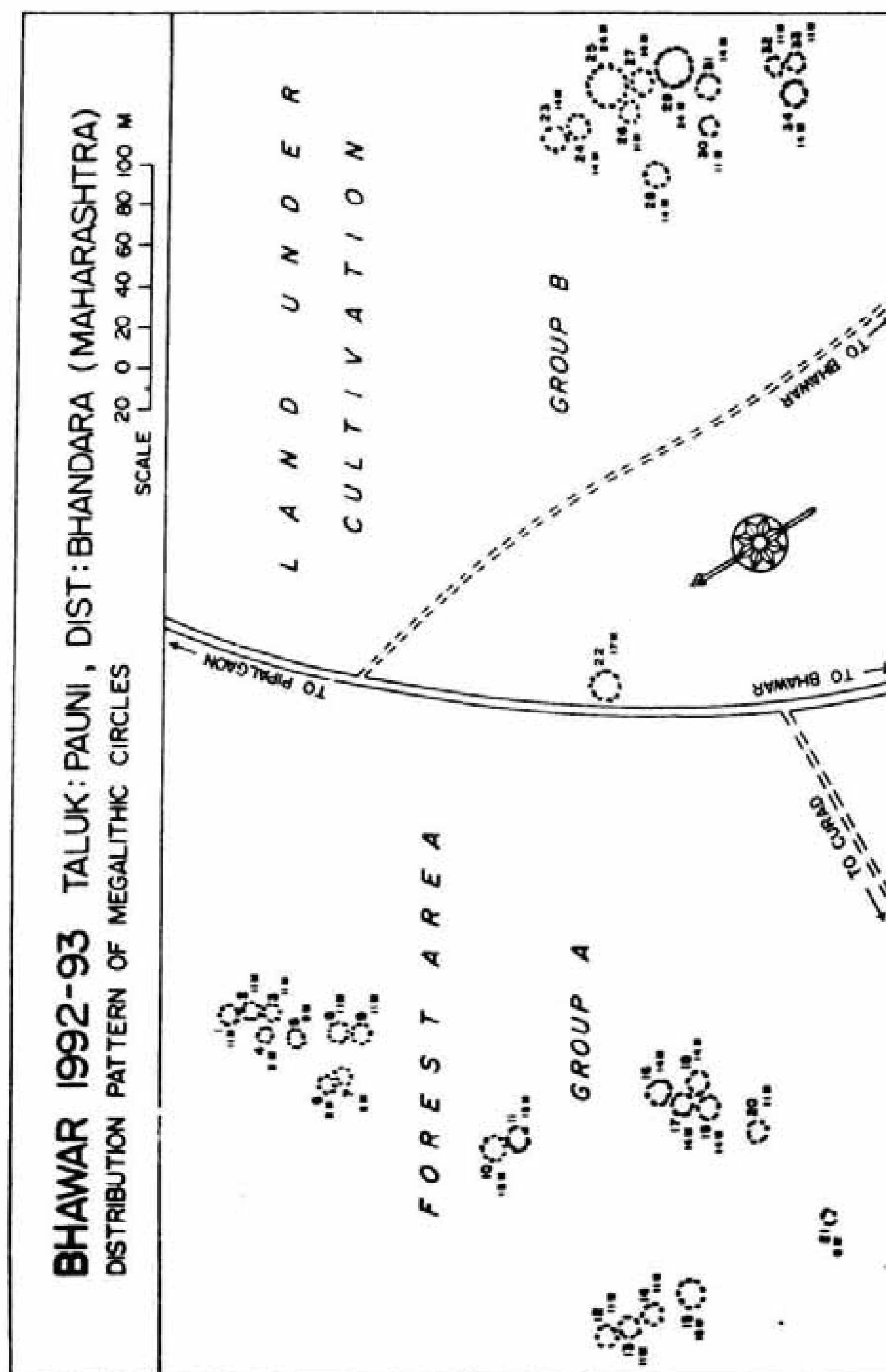

BHAWAR 1992-93 TALUK: PAUNI, DIST: BHANDARA (MAHARASHTRA)
DISTRIBUTION PATTERN OF MEGALITHIC CIRCLES
SCALE
20 0 20 40 60 80 100 M
LAND UNDER CULTIVATION
FOREST AREA
GROUP A
GROUP B
TO PIPALGAON
TO BHAWAR
TO BHAWAR

Fig. 6

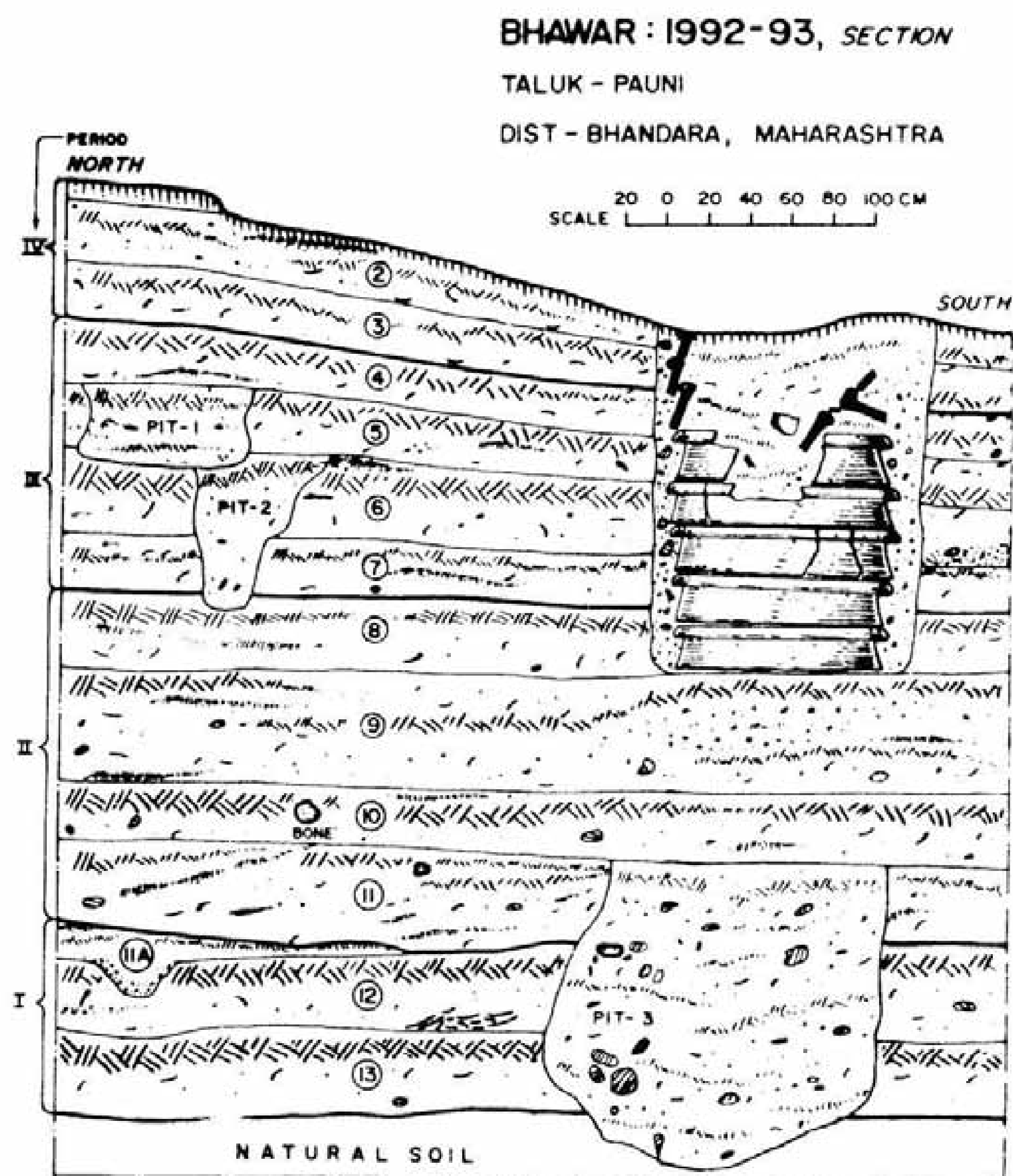

BHAWAR : 1992-93, SECTION
TALUK - PAUNI
DIST - BHANDARA, MAHARASHTRA
PERIOD
NORTH
SOUTH
SCALE
20 0 20 40 60 80 100 CM
IV
III
II
I
PIT-1
PIT-2
PIT-3
BONE
NATURAL SOIL

FIG. 7

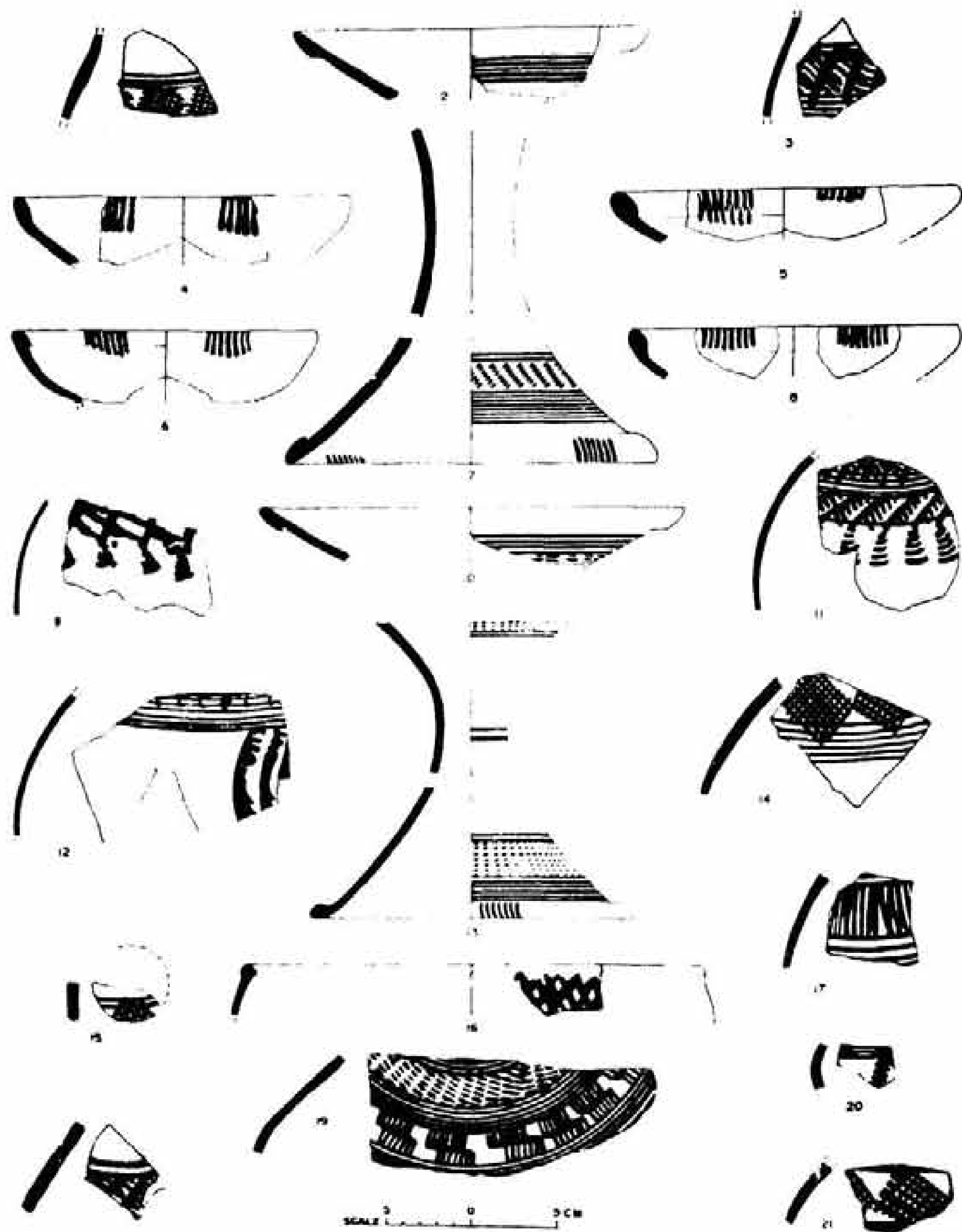


FIG. 8. *Bhawar : Painted pottery, Period I*

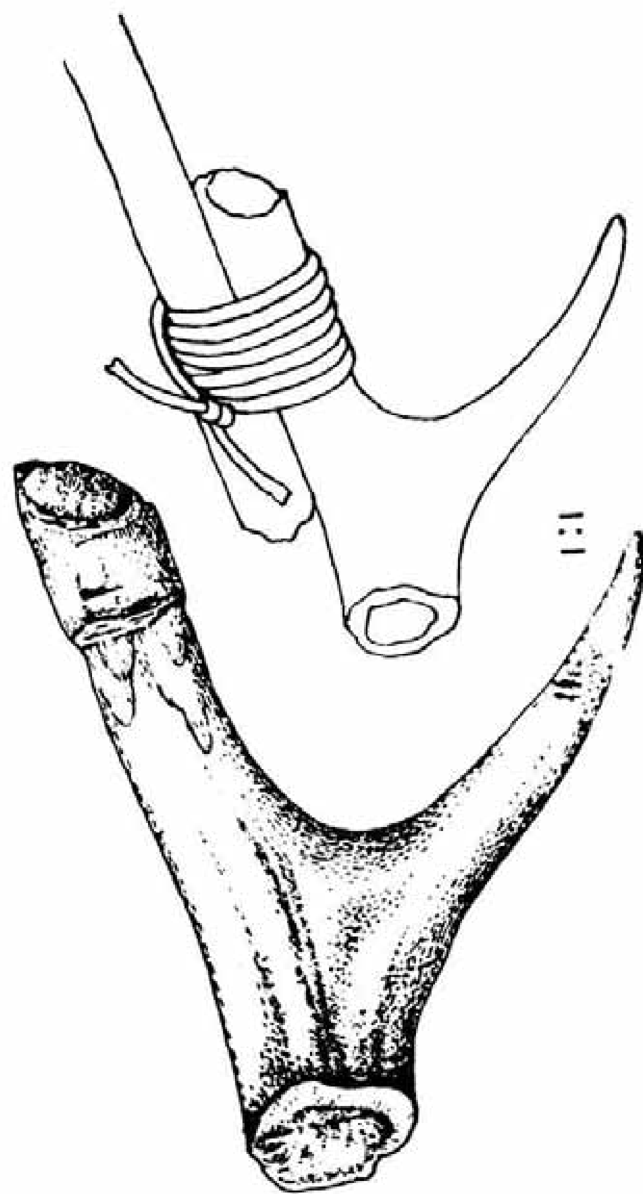


FIG. 9. *Bhawar : agricultural implements*

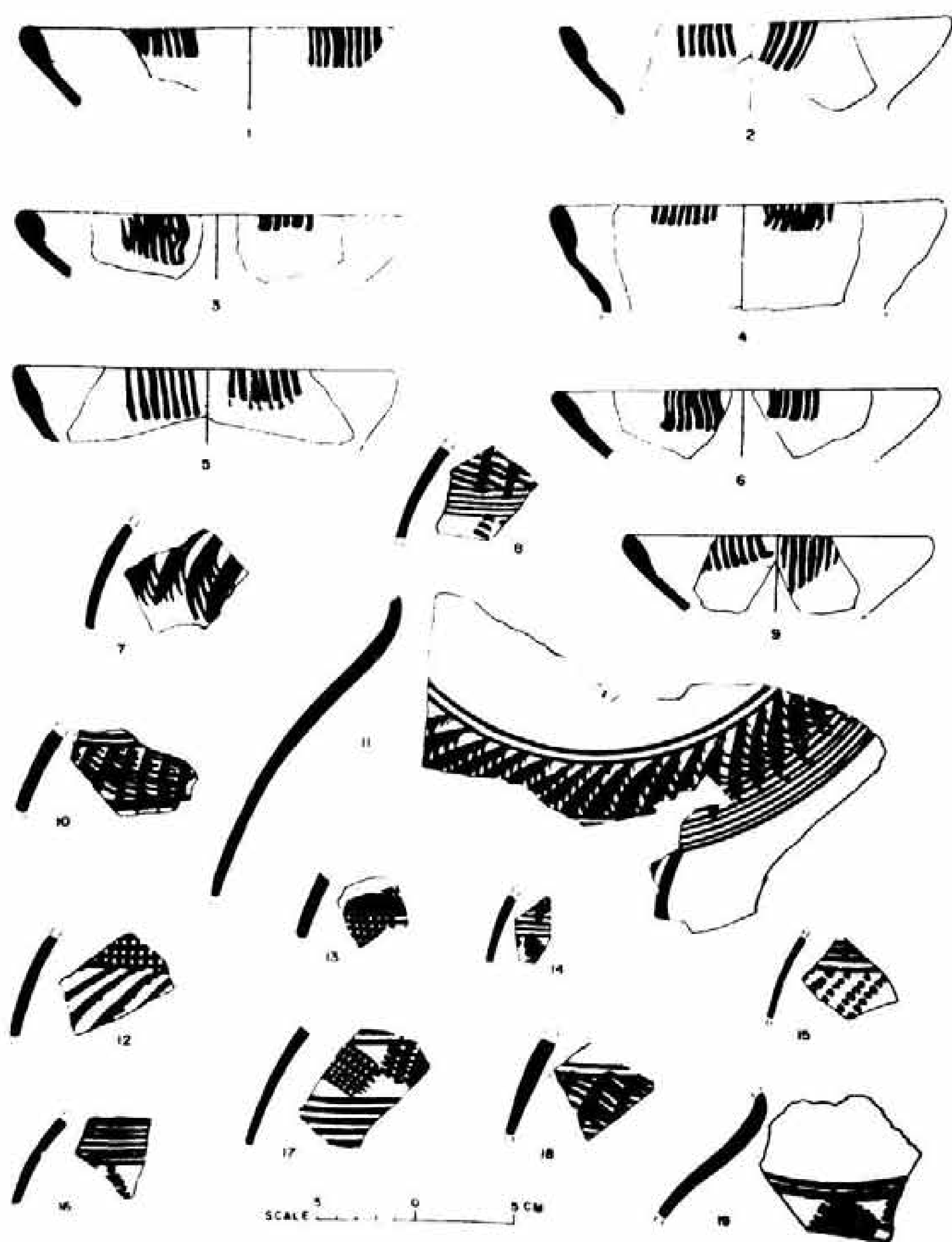


FIG. 10. *Bhawar : Painted pottery, Period II*

The entire deposit of 4-5 m has revealed a continuous sequence of culture divided into four periods (pl. XIX B; fig. 7).

Period I: Iron-free horizon (Layers 13-11 A)

Period II: Iron-using horizon (Layers 11-8)

Period III: Mauryan (Layers 7-5) Period IV :

Satavahana (Layers 4-1)

The deposit of Period I is composed of light to semi-dark brownish compact clay consisting of animal bones and bits of charcoal. From the level associated with iron, the ceramic industry introduced was essentially of red variety of medium fabric with a meagre supply of black and red ware. The available shapes were vases with out-turned and nail-headed rims, bowls with flat base and beaded rim, bowls with angular sides and dish-on-stand. The black painted design-elements were richer as compared to other sites of the region (fig. 8).

Though, the area available for excavation was very limited yet it yielded some of the best artefacts in the form of finished bone points and a worked antler possibly used as agricultural implement (fig.9).

Without any marked transformation in the ceramic industry or in the composition of the deposit, Period II was separated from that of the preceding one on account of occur-ence of iron artefacts. The deposit composed of brown to semi-reddish soil, mixed with a few animal bones and bits of ashes and charcoal. The ceramic industry showed limited use of burnished red ware of coarse to medium fabric. The other usual shapes met with were in the form of vases with flared and splayed-out rims, storage jars with out-turned rims, jars, basins, dish-on-stand, flat-based bowls, bowls with everted rims and bowls with straight sides and grooved externally. The design-elements were dominated by latticed diamonds panelled by horizontal bands and followed by oblique lines, 'mesh' type patterns, connected chevrons, series of dotted oblique lines and brush designs (fig. 10).

Traces of rammed mud-floor with post-holes and hearth were noticed from this level.

' The deposit of Period III is pale brownish compact soil consisting of animal bones, bits of charcoal and ashes. The ceramic tradition of red ware continued with certain innovations in the form of micacious red ware and application of red and brown slip; however, the perforated red ware was in short supply. The shapes met with in this period were storage jars and vases, basins, dish-on-stand, huge bowls with inverted rims.

The antiquities recovered from this horizon include grinding stones, iron objects like knives, points and rods and a few terracotta arecanut-shaped beads.

The deposit of Period IV was of light to dark brownish semi-compact soil. It yielded a rich ceramic tradition which included red-slipped ware, burnished red ware, micacious red ware, brown-slipped ware and pale red ware. The shapes included storage vases and jars and basins in coarse fabric, vases, dishes with flat base, ledged-bowls and lids, multi-lipped vases and cups of medium fabric.

Among the decorated pottery, traditions of applique and stamped varities were noticed. The applique decorations occur around storage jars and vases together with triangular incisions. The

Profuse pottery was recovered from these trenches from all the layers. The fabrics include micaceous red ware, the thicker variety with mica flakes and the thinner with mica powder; the thicker as well the finer variety; a black-and-red and the burnished black ware; a red-slipped ware, often with a bright and burnished-red slip and a coarse reddish brown ware. A noteworthy feature is the large quantity of black-on-red painted pottery displaying geometrical as well as floral designs. Besides pottery, small iron objects and terracotta discs and beads were of regular occurrence in these trenches. Ample animal bones were encountered in all layers and though *prima-facie* the cattle bones appear predominately tiny, fragile bird bones were also picked up in good quantity. A preliminary assessment of the grains collected through systematic floatation indicates a preponderance of rice and *moong*.

Two trial trenches, each measuring 2 X 2 m were also dug on the western and southern slopes of mound 5 to determine the extent of the habitation. Trench X 1 on the eastern slopes of the mound, going down towards the river was dug to a depth of 60 cm and revealed distinct micaceous red and black and red ware as well as animal bones in good quantity. Trench X 2 located in the low-lying area on the southern fringes of the mound was gradually expanded to a full trench and a half, measuring 7.5 X 7.5 m. It was dug to a depth of 65 cm to reach the virgin soil. Four successive floor levels were exposed. The topmost, at a depth of 20 cm, revealed two well-preserved hearths, one of which was of a rather elaborate design, with two cooking hearths joined together with a covered L-shaped passage serving as a heating place. The lowermost floor level consisted of an even and compact greyish floor spread across the entire trench area. Pottery similar to trenches B, C and D was recovered in large quantities. An intact adze was one of the noteworthy iron finds while terracotta discs and beads were of common occurrence. Animal bones from all layers and grains from hearth-areas were recovered in good quantity. The trial trenches established an extensive habitation spread over the entire mound as well its slopes to the river.

In addition to the habitation megalithic circle 27 located on mound V was also excavated. The circle with a diameter of 14 m and a filling of 75 cm brought forth some intact iron objects, adzes and nail-parers, a dagger-blade, a spearhead in very good condition of preservation. No skeletal remains were encountered. The circle thus represented a symbolic burial. The pottery recovered from the circle was small in quantity, badly fragmented, micaceous but coarse, brittle and greenish brown in colour.

51. EXCAVATION AT PACHKHERI, DISTRICT NAGPUR.— The Excavation Branch I, Nagpur of the Survey, carried out excavations at Pachkheri (20° 55' ; 79°30) in taluk Kuhi under the direction of Amarendra Nath, assisted by N.C. Prakash, S Prathapachandran, Ch. Babjirao, N.K.S. Sharma, H.J. Barapae, D.K. Kasbi, D.D. Shambharkar, R.G. Nagulwar and S.M. Khairkar. The village lies slightly over sixty km south by south-east of Nagpur, approachable via Kuhi-Mandhal road leading to Ambhora. There is a regular state bus service connecting these places. Earlier the site was explored *(1987-88,* pp. 85-87) as a part of documentation of hamlet sites around Adam (21° 00'; 78° 39'), a major settlement site of this region *(1988-89,* pp. 50-62; *1989-90,* pp. 61-65; *1990-91,* pp. 45-50; *1991-92,* pp. 63-68). It reported a rare combination of ancient habitation (PKD-1) associated with the remains of menhirs (PKD-2) and pit-circle with cairn (PKD-3).

In all four cuttings, one each at PKD-1 and PKD-3 and two at PKD-2, were laid out in order to ascertain the sequence of culture and chronology of the site and the nature and formation of the menhirs

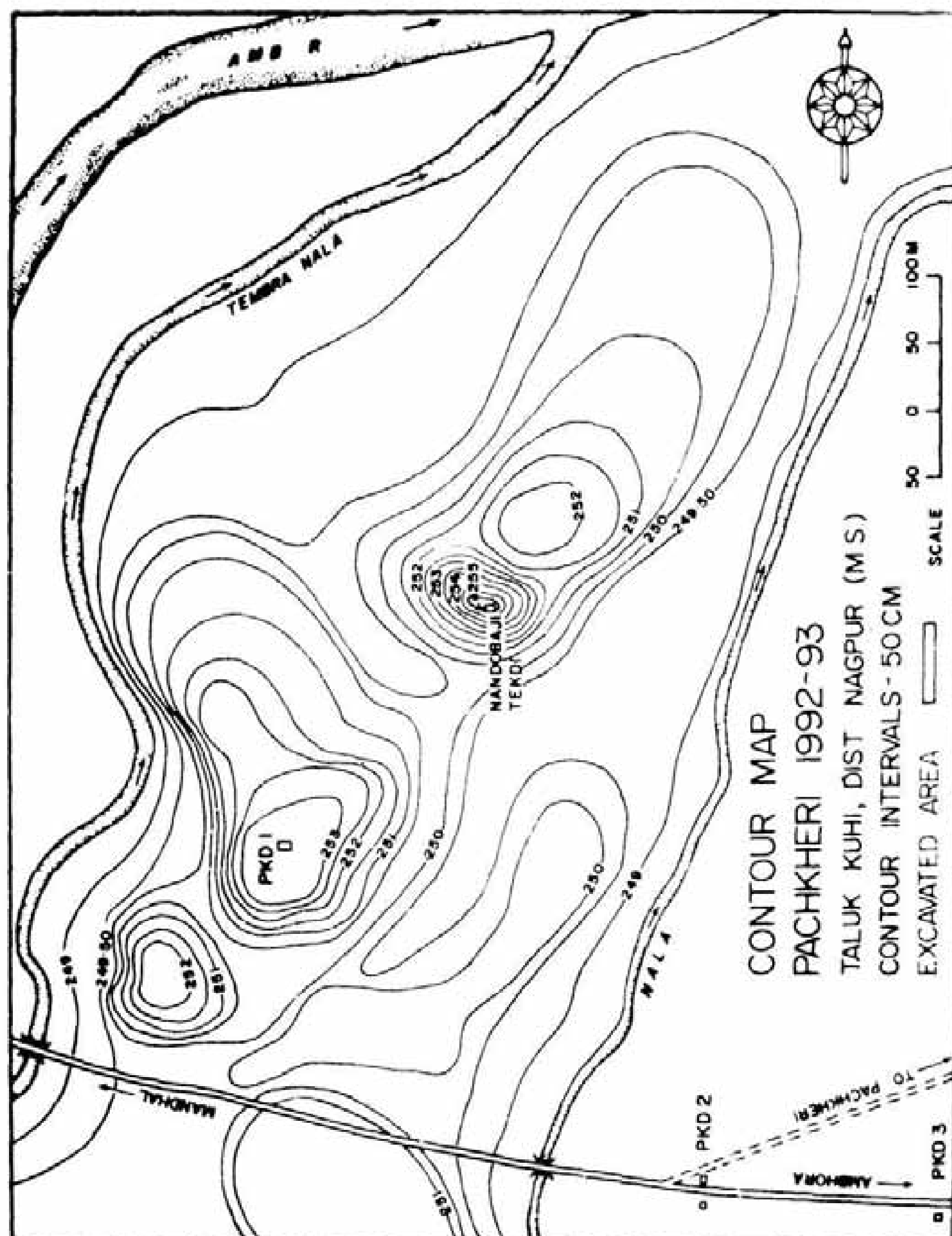

CONTOUR MAP
PACHKHERI 1992-93
TALUK KUHI, DIST NAGPUR (M S)
CONTOUR INTERVALS - 50 CM
EXCAVATED AREA
SCALE
50
0
50
100 M
AMB R
TEMBRA NALA
NALA
NANDOBAJI TEKDI
PKD 1
PKD 2
PKD 3
MANDHAL
AMBHORA
TO PACHKHERI
249
249.50
250
251
252
253
254
255

FIG. 11

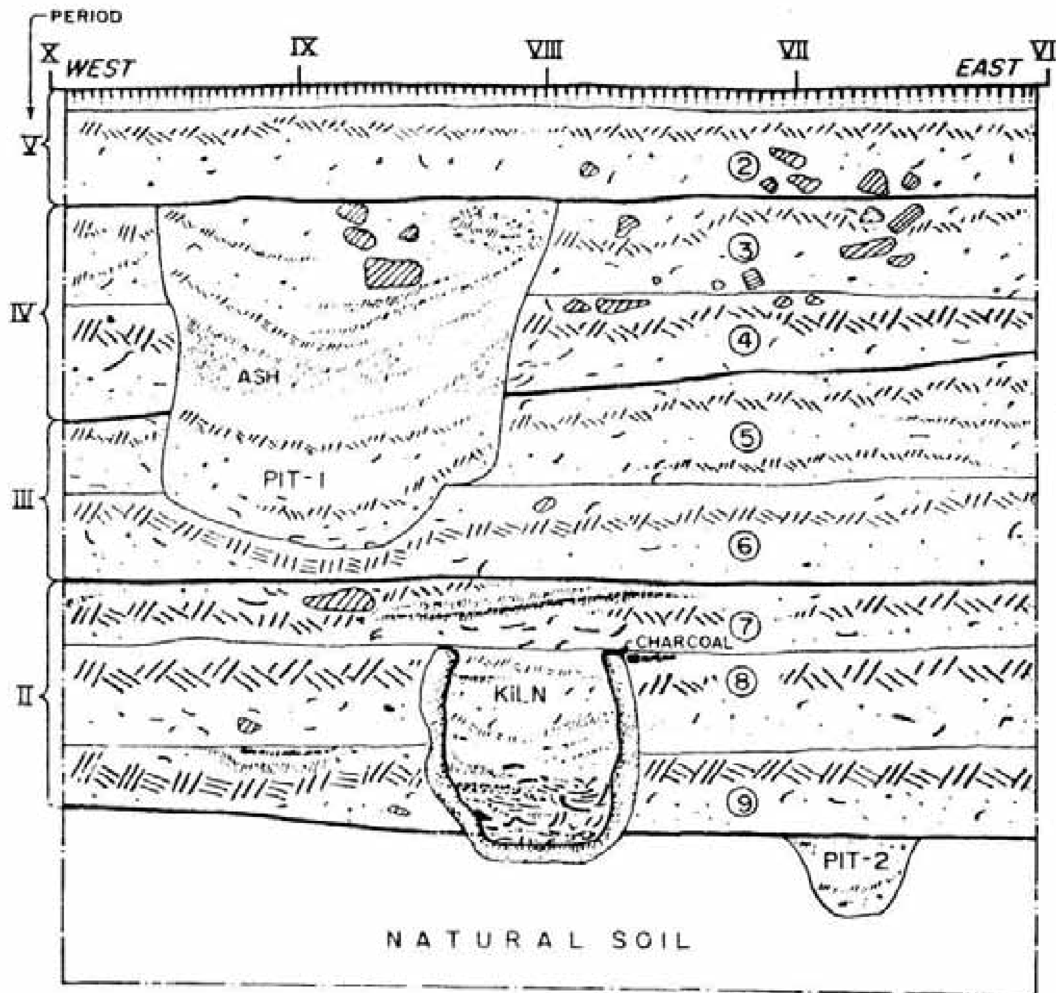

PACHKHERI-I: 1992-93, SECTION
TALUK - KUHI
DIST - NAGPUR, MAHARASHTRA
SCALE 20 0 20 40 60 80 100CM
PERIOD
X WEST
IX
VIII
VII
EAST VI
V
IV
III
II
ASH
PIT-I
CHARCOAL
KILN
PIT-2
NATURAL SOIL

Fig. 12

and pit-circle with cairn, besides its correlation with the habitation strata (fig. 11). It afforded evidence of five distinct occupational deposits (fig. 12). Period I being Mesolithic in character was noticed in the cuttings of PKD-2, while both the types of burials assigned to Period II were coeval with the lowermost horizon of the iron using folk noted at the habitation site (PKD-1). The remaining three successive occupational periods identified were Mauryan (Period III), Satavahana (Period IV) and Medieval (Period V).

At PKD-2 in Period I, the trench laid on the south side of the main road yielded microlithic assemblage, free from pottery, from layer (2) while the other cutting laid on the north side of the same road has reported it from layer (3) (figs. 13-14). It may be clarified here that these cuttings are along the southwestern slope, but due to its ruthless cutting to form artificial terraces for paddy cultivation, its primary soil coverage has undergone drastic change in the recent past. It has caused denudation of primary sediments in the southern cutting area living a thin deposit over the microlithic layer while in the northern cutting secondary deposition led to thick accumulation over the said layer. However, the composition of the sediments yielding microlithic tools has remained homogenous. The deposit twenty-five to thirty cm thick, composed of poor clay content of compact dull brown colour, mixed with coarse lateritic gravel, rests over the consolidated matrix of Deccan trap. The microlithic assemblage essentially non-geometric in character comprise mostly simple artefacts such as flakes, chips, blades, flake and blade cores, apart from a few specimens of points and a backed blade (pl. XX A).

Attributed to Megalithic culture of Vidarbha, Period II witnessed iron technology, painted and unpainted ceramic industry (PKD-1) besides raising of monuments of memories (PKD-2 and PKD-3). The cutting at PKD-1, which revealed occupational layers of Period II, was laid on a reasonably flat land at 253 m contour elevation. Immediately overlying the natural black cotton soil mixed with gravelly material was homogeneous deposit of greyish soil of semi-compact nature, represented by three layers, namely (9) to (7). The ceramic industry of the period mainly Black and Red ware, red ware with and without paintings and black-slipped ware. The shapes met with were vases, bowls and dishes. Some of the shapes of red and Black and Red wares bore black paintings on rim and shoulder portions. The design-elements included latticed diamonds, comb pattern over the shoulder and group of vertical strokes covering both inner and outer surfaces of the rim.

Apart from patches of mud-floors, a kiln of U-shape was noticed. It was contemporary to layer (8) and its chamber was cut into layer (9) while its base was resting over the natural soil. It measured 85x75 x 10 cm (pl. XXI A).

An iron rod (PKD-1) and a ring fastener of plano-convex shape and a copper bowl (PKD-3) are some of the important finds of this horizon.

Period III, layers (6) and (5), attributed to the Mauryan period did not reveal the diagnostic pottery types, however, it brought to light a few associated red wares showing vases of Ahichchhatra 10A type and Black and Red ware bowls generally occurring in the NBPW horizon in the Gangetic plains. The deposit was comprised of semi-compact brownish soil mixed with ash, charcoal and bones. The ceramic traditions introduced were of a coarse dull red ware and micaceous red ware. A mud-floor of uneven

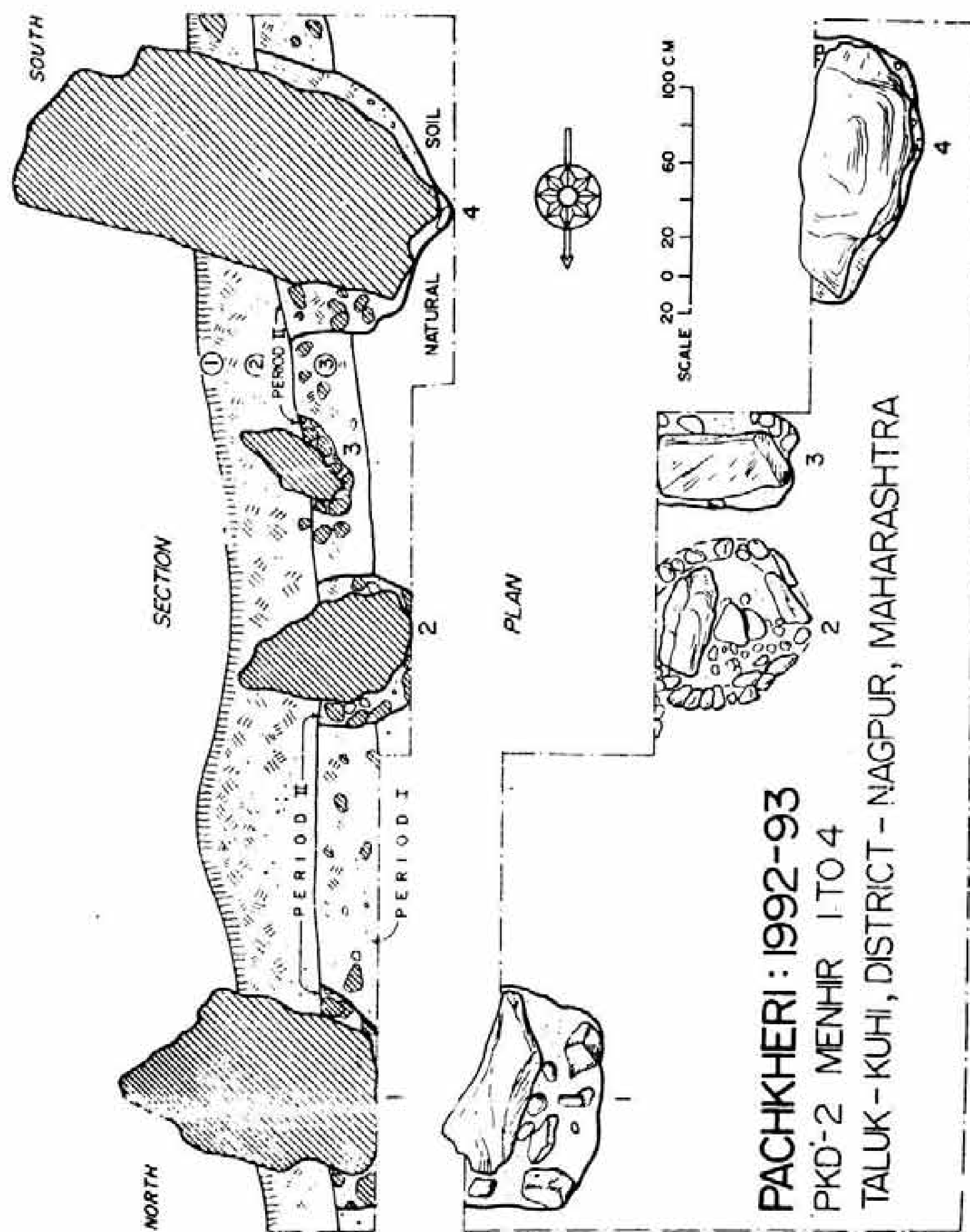

PACHKHERI : 1992-93
PKD-2 MENHIR 1 TO 4
TALUK-KUHI, DISTRICT-NAGPUR, MAHARASHTRA
SECTION
PLAN
NORTH
SOUTH
SOIL
NATURAL
PERIOD II
PERIOD I
SCALE
20 0 20 60 100 CM
1
2
3
4

FIG. 13

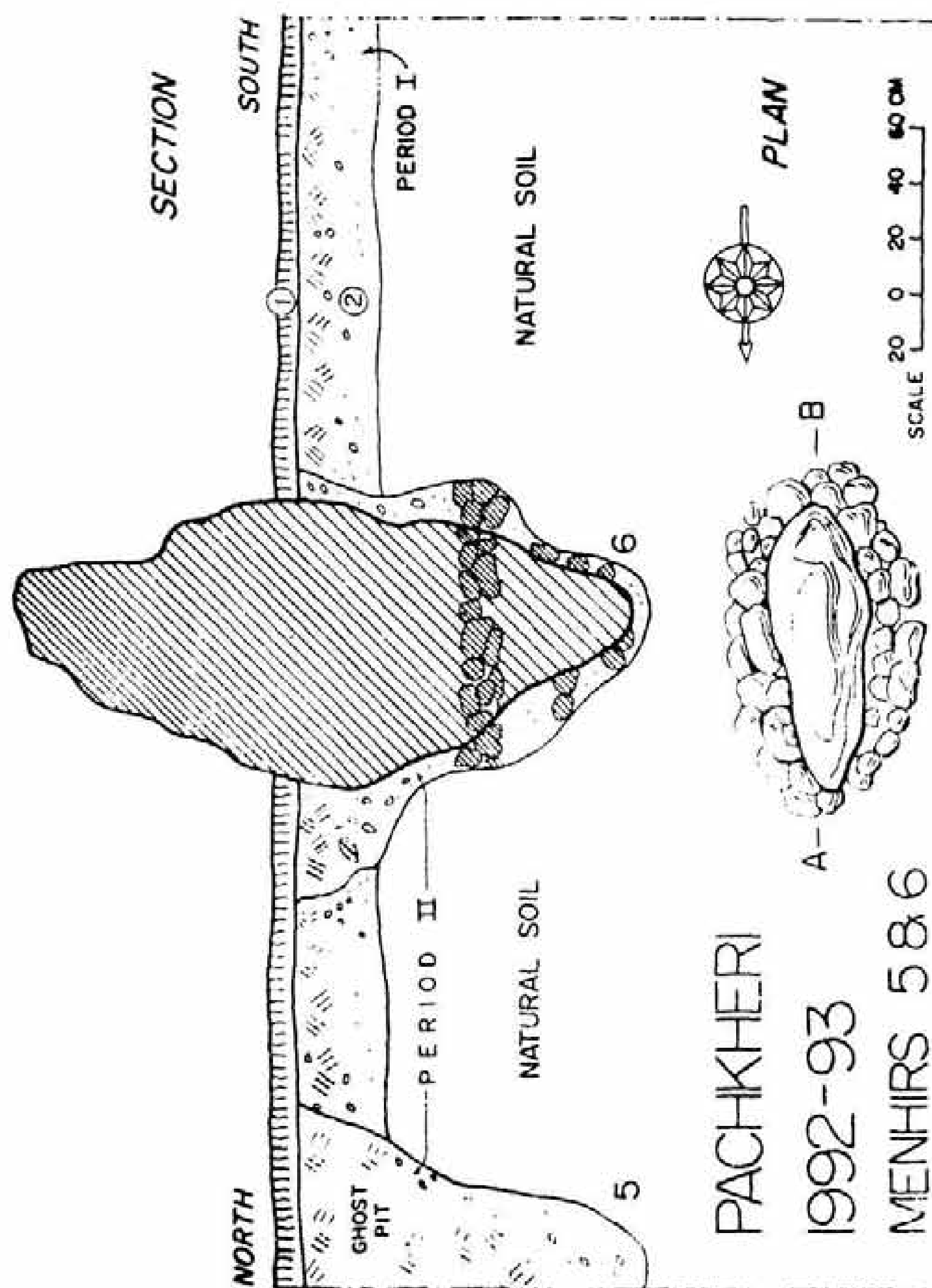

SECTION
NORTH
SOUTH
GHOST PIT
PERIOD II
PERIOD I
NATURAL SOIL
NATURAL SOIL
1
2
5
6
PLAN
A
B
SCALE
20 0 20 40 60 CM
PACHKHERI
1992-93
MENHIRS 5 & 6

Fig. 14

type (4 X 4 m) with irregular post-holes was recorded from this horizon. Among the finds animal bones of the *Bos* species predominated over other species. Important antiquities included iron sickle and ring-fastener, terracotta annular bead and an ear-stud.

Layers (4) and (3) of the habitation in Period IV were attributed to the Satavahana. The deposit comprised a semi-compact light brown soil mixed with stone rubble. Earlier pottery types decreased in frequency and medium fabric of red and brown-slipped ware made its appearance. Important shapes constituted typical multi-lipped vases, storage jars, basins and lid-cum-bowls. Some of the characteristic stamped pottery showed *tri-ratna* occurring at regular intervals on the shoulders of vases while a group of rosettes figured' below a thick rim (pl. XX B). The deposit was much disturbed due to a later pit activity.

Among the antiquities arrowheads, knives and U-shaped clamp of iron, polisher and grinder of stone, votive tanks, spindle-whorls of terracotta, and beads of semiprecious stone and terracotta deserve special mention.

In Period V, layers (2) and (1) composed of grey to black soil mixed with brick-bats were assigned to medieval period. The distinguishing ceramic industry included grey and red wares of medium to coarse fabric. The frequency of antiquities found from this horizon were higher than the rest of the cultural levels. It included couple of gold objects namely a tiny rectangular fragment of a bangle (?) and a disc, copper objects in the form of bangles and rings, iron objects like knife, arrowhead, chisel, spatula, spoon, needles, nails and clamp, terracotta objects like mother goddess, animal figurines, wheel and spindles, skin rubber, crucible etc., beads of semiprecious stones, glass and terracotta were also reported. Dating evidence was provided by a copper coin issued by Muhammed Shah I of Bahmani dynasty {*circa* fourteenth century AD).

PKD-2 (Menhirs), basically aligned in the north-south direction, these menhirs are one of the unique group of monuments ever reported from any of the Megalithic site situated in the Wainganga valley (pl. XXII A). Here, Menhirs 1 to 4 fall in the cutting of north side of the road (fig. 13) while the remaining two at south (fig. 14). Menhirs of these two cuttings need not be separated into two groups as the laying of road across the alignment is a recent phenomenon, it is quite likely that in the process of laying some of the intermediary menhirs got uprooted.

The cuttings revealed a departure in the mode of erection of menhirs noted earlier in the excavations at Maski where the excavated ones revealed that it was raised on the existing ground itself without any pit and was propped up all round by a ring of rubble packing *(AI,* no. 13, 35-37, fig. 8, pls. XV-XVI). In contrast, here these were all found raised in pits of various shapes and sizes, dug into the natural soil. Like Maski, no sepulchral association was observed either in the respective pits or within the excavated area. But some of the pits showed some special features.

Menhir 1 consists of an undressed monolith showing sub-rectangular cross-section. Tilted towards south, it measures 125 X 90 X 35 cm. For erecting a pit of approximately 40 cm deep and 120 cm in diameter was dug. After erection it was filled with dug up soil from all the sides, however, from

the western side it was strengthened by heavy duty stones, one of the upright stone packing was even visible above the ground level.

Menhir 2 slightly deviated towards west from the alignment, was raised at a distance of approximately 180 cm from the former. It consisted of barely worked slab of conical form and irregular section. Tilted towards east it measured 95 X 60 X 25 cm. The circular pit (dia 85 cm) upto a depth of 45 cm bore some special features. Along the pit line it had ring of stone-work forming an enclosure, an unusual phenomenon never reported before. Inner part of it was given a dressing of fine levigated clay at the base and was pitched with not only with uneven stones but also by two split stones of triangular shape. Above it the pit was filled with usual packing of stone mixed soil.

Almost in the same alignment of the former was found another menhir of rectangular shape (70 X 40 X 15 cm). This Menhir 3 was laid horizontally in an oblong pit (80 X 45 X 20 cm) with a tilt towards south. After laying the partially dressed slab the sides of the pit were meticulously pitched with stones.

Further deviated towards east, from the alignment of the former two, Menhir 4 was one of the largest menhirs erected at the site. Tilted towards south, it measured 215 X 100 X 40 cm. Barely worked boulder damaged from the top was fixed in U-shaped tapering pit (170 X 100 cm).

Menhir 5 was erected on the south side of the road at a distance of approximately twenty-five metre from the former. Of this menhir only the ghost pit of conical shape was noticed in the cutting of Menhir 6. Its removal, in recent past, for domestic purpose was verified from the villagers.

Damaged from the top, Menhir 6 consisted of a partially dressed conical monolith showing near oval cross section (fig. 14). It measured 220 X 100 X 40 cm. An interesting feature noticed in the pit was the formation of stone-ring of two courses at a depth of 75 cm, deviced in order to secure its upright position (pl. XXIB). Below and above this ring the filling was haphazard type of dug out sediments.

Pit-circle with cairn (PKD-3) consisted of a circle of undressed Deccan trap boulders with an external diameter of 16m (fig. 15). The circle stones of southwestern side were dislodged while some of the stones in western side were virtually removed in recent day s (pl. XXII B). The centre of the circle entombed a near oval pit burial measuring 380x300x80 cm. The upper section of the pit showed a deposit of the gravel mix brownish red soil which formed the contemporary working level (layer 3), while the lower section had natural gravel deposit. Towards the eastern base of the pit a stone slab (170 X 45cm) of Menhir-6 (PKD-2) type was found placed in north-south orientation. No other material of funerary rights was found at the base, however, a battered copper bowl was placed at the upper portion of the northern inner edge of the pit. Further, say 120 cm west of the pit were noticed red ware vases having typical flared or near funnel type rims, in a battered condition immediately above the contemporary working-level. Apparently, the gravegoods were placed at all levels, without any regular order, having evidently been placed simultaneously with the throwing in of the filling earth. The first 55 cm of the pit (layer-5) was filled with fine brown clayey earth brought from elsewhere while its remaining upper portion was piled up to a height of 60 cm with uneven local stone chips (layer 4), forming an hemispherical heap above the contemporary working level (i.e., ancient humus, layer 3).

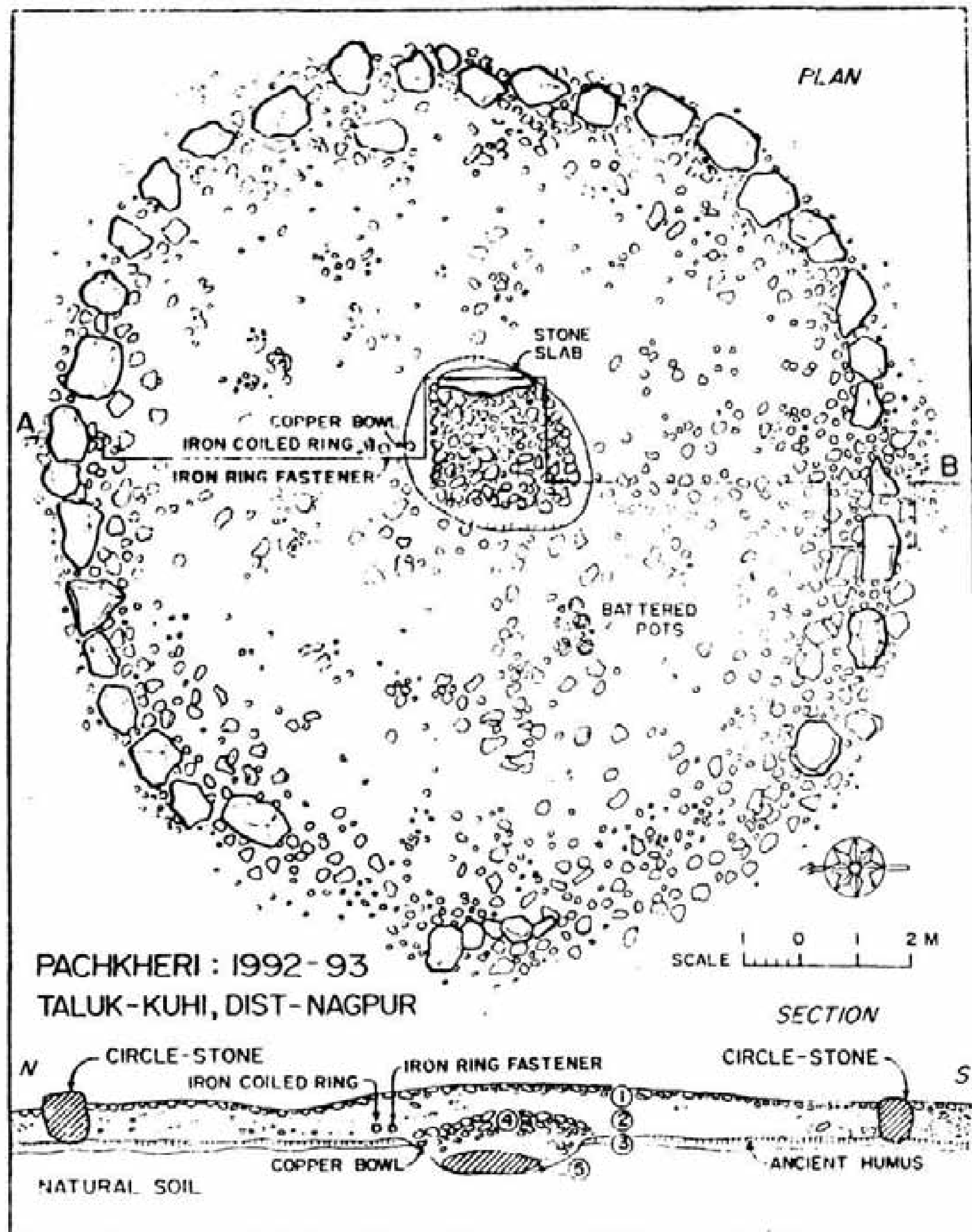

PLAN
STONE SLAB
COPPER BOWL
IRON COILED RING
IRON RING FASTENER
A
B
BATTERED POTS
PACHKHERI : 1992-93
TALUK-KUHI, DIST-NAGPUR
SCALE
0
1
2 M
SECTION
N
S
CIRCLE-STONE
IRON COILED RING
IRON RING FASTENER
CIRCLE-STONE
COPPER BOWL
ANCIENT HUMUS
NATURAL SOIL

FIG. 15

After the completion of interment process the circumference of the circle was sealed by two successive layers of earth acquiring the shape of the hemispherical tumulus. The penultimate layer (2) was dump of say 80 cm in height of locally available earth of dark brown colour occasionally mixed with stone chips. Above it, layer (1) was the deposit of cairn and brownish earth systematically served as dressing to the tumulus. Its concentration on the southern half was more than on the northern half of the circle. Such an uneven scattering of cairn was mainly due to the lack of strewing system, it had nothing to do with the disposal practice.

52. EXPLORATION IN DISTRICT NAGPUR.— The Prehistory Branch, Nagpur of the Survey under the direction of A.K. Sharma assisted by N. Taher, K.M. Girhe, N.K. Nimje, P.V. Janardhanan, C.L. Yadav, Ghayasuddin, P.C. Dogra and T.B. Thapa located a Mesolithic site near Karanja (21° 10'; 78° 25') about 72km from Nagpur on National Highway no. 6. Both Late Stone Age and Mesolithic tools shaped on quartzite and agate nodules have been found. The tool kit comprises of arrow-heads, scrapers (side, hollow and end), points and few burins. The tools are found embedded in the sections.

Apart from this another Mesolithic site was also located in the vicinity of village Khetapur (21° 11'; 78° 54') about 27 km west of Nagpur. Here the entire elevated area of nearly 1 sq km starting from the bank of *nullah* upto the road leading to Kalmeswar is full of finished, unfinished tools and raw material. It is one of the ideal Mesolithic sites in the area. The tools comprise points, blades, scrapers, burins, etc. These tools were shaped out of cherty materials, quartz and agate, found in plenty in the area in the form of veins in the granitic outcrops.

53. EXPLORATION IN DISTRICT RAIGAD.— The Prehistory Branch, Nagpur of the Survey under the direction of A.K. Sharma, assisted by P.V. Janardhanan, C.L. Yadav, Ghayasuddin, P.C. Dogra and T.B. Thapa discovered the following sites.

On the way from Alibag to Revas, on the eastern side of the hill near a natural spring a rich factory site belonging to Early Stone Age was located at Pedambe (18° 45'; 72° 57'). The tools are found concentrated mostly in the bed of small stream and are covered by nearly 0.57 m to 1 m thick deposit of earth which is of recent origin. The assemblage mostly comprise handaxes and scrapers apart from few choppers. Majority of them are made on quartzite and quartzitic sandstone. Most of them are in very much rolled condition as they come from top of the nearby hill. Some of the tools are surprisingly much bigger in size as compared to tools of this period from other sites.

Middle Stone Age sites were located on the right bank of Kundalika river at Baple (18° 34'; 72° 59') and Shenvai (18° 24'; 73° 16') on the way from Alibag to Roha. The tools mostly made on trap and some on quartzite comprise handaxes, scrapers and choppers. On top of the hill just above the level where tools are found, there is evidence of sea fossils. This is indicative of the fact that in the remote past the sea level was much higher in this area. Apart from the above Middle Stone Age sites, tools are also found at Ambirali (18° 46'; 73° 04') and Kolapur (18° 50'; 73° 17').

At Pedambe (18° 45'; 72° 57') Early Stone Age site was found. Remains of three temple sites were located near the present Bhubaneswar temple built by Ahalyabai Holkar. All these sites are located along the natural spring. At the site of the earlier temple which was destroyed by Afzal Khan, Siva-*linga*

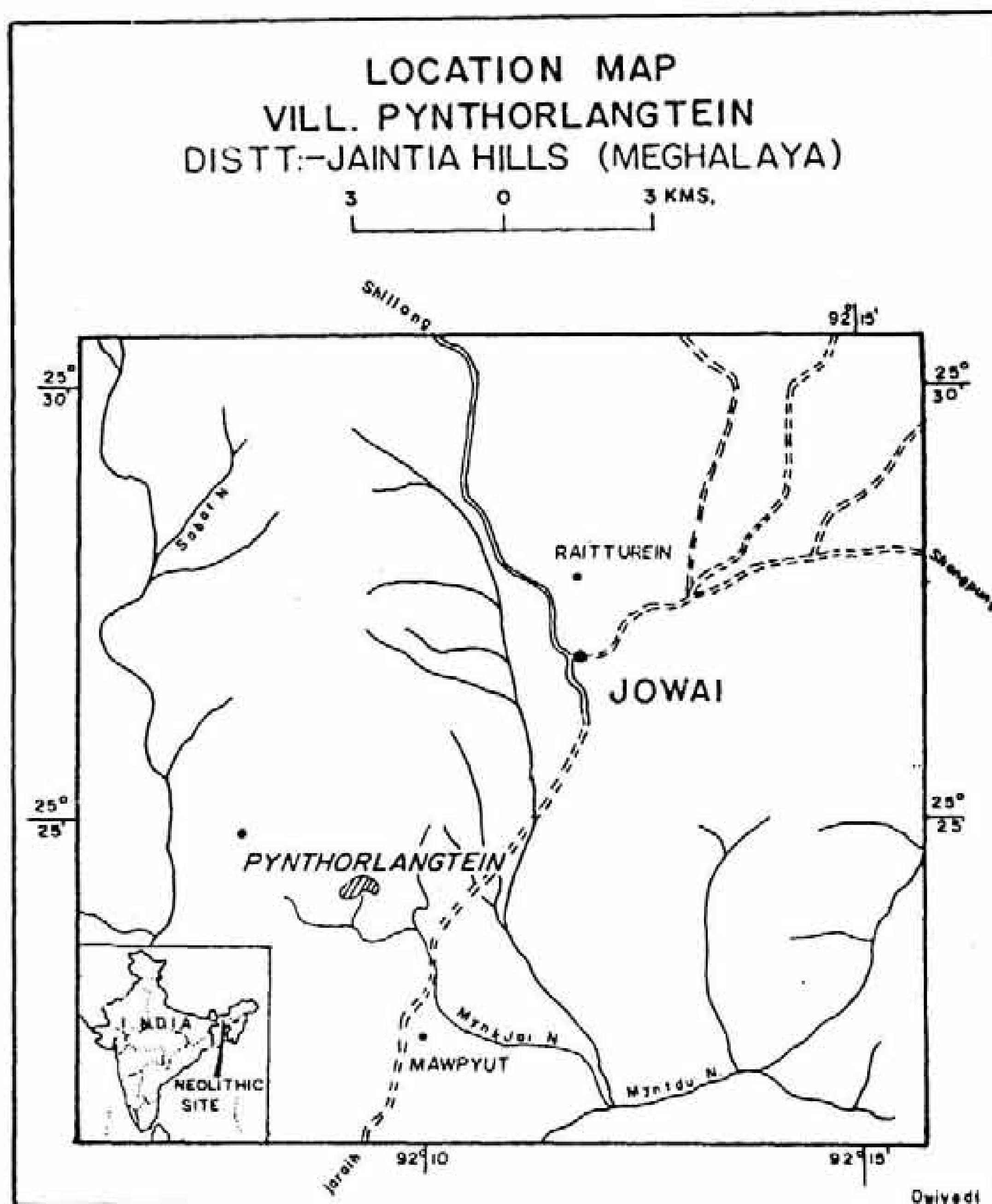

LOCATION MAP
VILL. PYNTHORLANGTEIN
DISTT:-JAINTIA HILLS (MEGHALAYA)
3 0 3 KMS.
Shillong
RAITTUREIN
JOWAI
PYNTHORLANGTEIN
MAWPYUT
Myntdu N.
INDIA
NEOLITHIC SITE
25° 30'
25° 25'
92° 10
92° 15'
Dwivedi

FIG. 16

along with damaged *yoni,* beautiful image of Vishnu, a broken image of Ganesa and some pieces of sculptures are still lying. The plan of the temple is also available.

MEGHALAYA

54. EXCAVATON AT PYNTHORLANGTEIN, DISTRICT JAINTIA HILLS.— Under the direction of L.S. Rao, assisted by N. Taher, R.K. Dwivedi, C.L. Yadav, Ghayasuddin, P.C. Dogra and P.D. Satpute of Prehistory Branch, Nagpur of the Survey took a trial trench measuring 2 X lm at Pynthorlangtein (25° 22'26"; 92° 06' 07") in Jowai tehsil with a view to ascertain the nature of the habitational deposit (fig. 16).

The trial trench taken up at the highest point of the mound yielded a cultural deposit of one metre comprising Neolithic cultural milieu. The composition of assemblage and the occurrence of artefacts in various stages of manufacture suggest it to be a factory site (figs. 17-18). The tool assemblage includes adzes (pl. XXIII A), axes (pl. XXIV), chisels, points, blades, scrapers, polishers, penknife, flake-blanks, cores and flakes.

Majority of the celts are chipped and a few are partly ground. Besides the lithic artefacts, a few-sherds of hand-made, coarse, red ware pottery with cord impression were collected at a depth of 60-80 cm (pl. XXIII B). Apart from this some charcoal was collected from almost the same depth. It is interesting to note that the shouldered celt which is invariably associated with the neolithic culture of north-east is conspicious by its absence.

55. EXPLORATION IN DISTRICT JAINTIA HILLS.— L.S. Rao, assisted by N. Taher, R.K. Dwivedi, C.L. Yadav, Ghayasuddin, P.C. Dogra and P.D. Satpute of Prehistory Branch, Nagpur of the Survey discovered the following sites in Jowai tehsil.

Village/Site	*Nature of remains*
Mawput (25° 22' 26"; 92° 06' 07")	Historical mound of 30x30 m dimension locally known as Pdeng Lameli yielded red ware potsherd with rough exterior surface.
Pynthorlangtein (25° 22' 26"; 92° 06' 07")	Neolithic artefacts such as adzes, axes, chisel and grinding stone
Riat Turein (25° 27' 08"; 92° 11[1] 55")	A solitary partially polished faceted celt (6.7 X 3 X 2-2 cm) from the surface of a low hillock on the right bank of Myntdu river from secondary context

56. EXPLORATION IN DISTRICT WEST GARO HILLS.— L.S. Rao assisted by N. Taher, R.K. Dwivedi, C.L. Yadav, Ghayasuddin, P.C. Dogra and P.D. Satpute of Prehistory Branch, Nagpur of the Survey discovered the following sites in Phulbari tehsil.

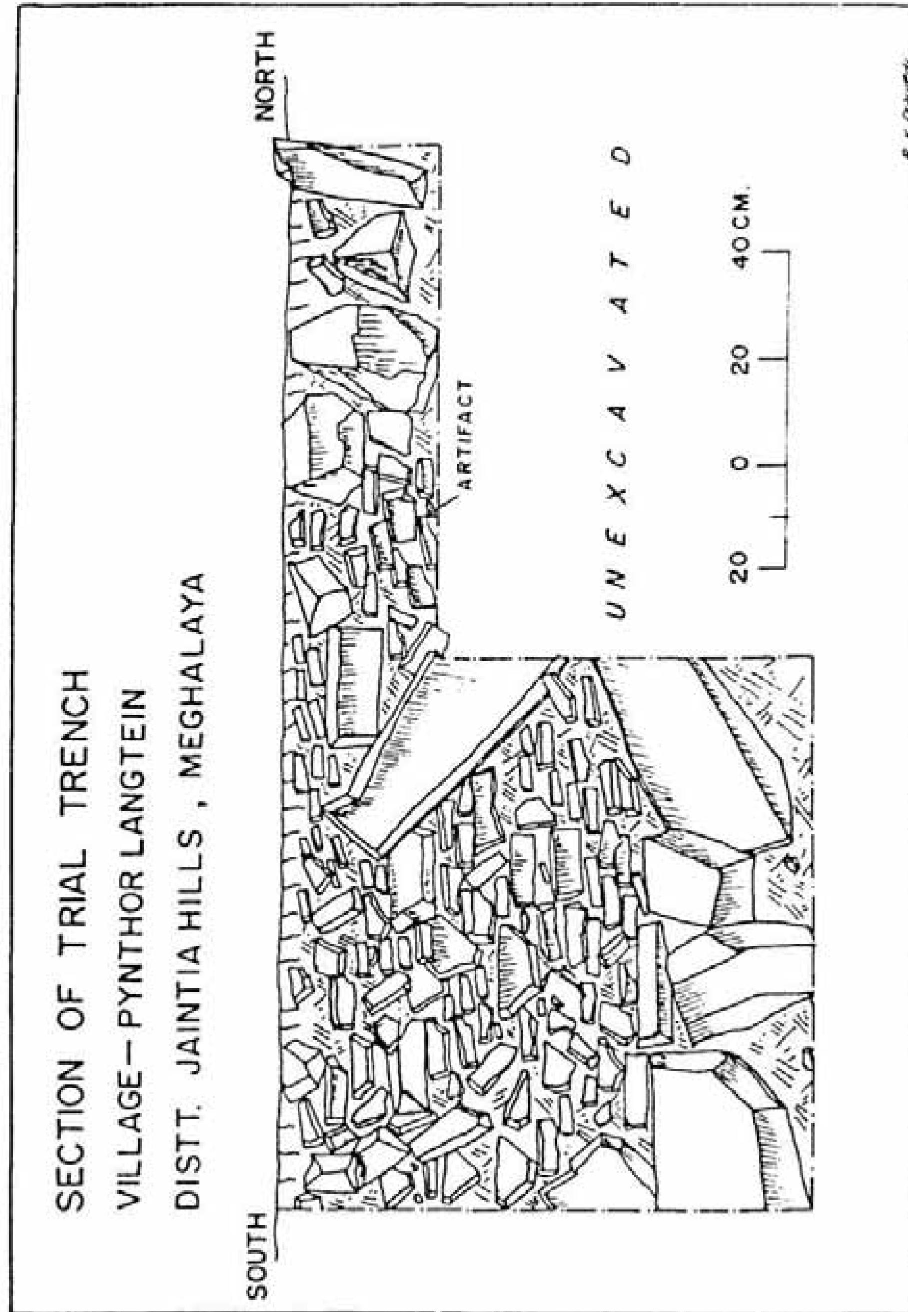

SECTION OF TRIAL TRENCH
VILLAGE — PYNTHOR LANGTEIN
DISTT. JAINTIA HILLS, MEGHALAYA
SOUTH
NORTH
ARTIFACT
UNEXCAVATED
20
0
20
40 CM.

FIG. 17

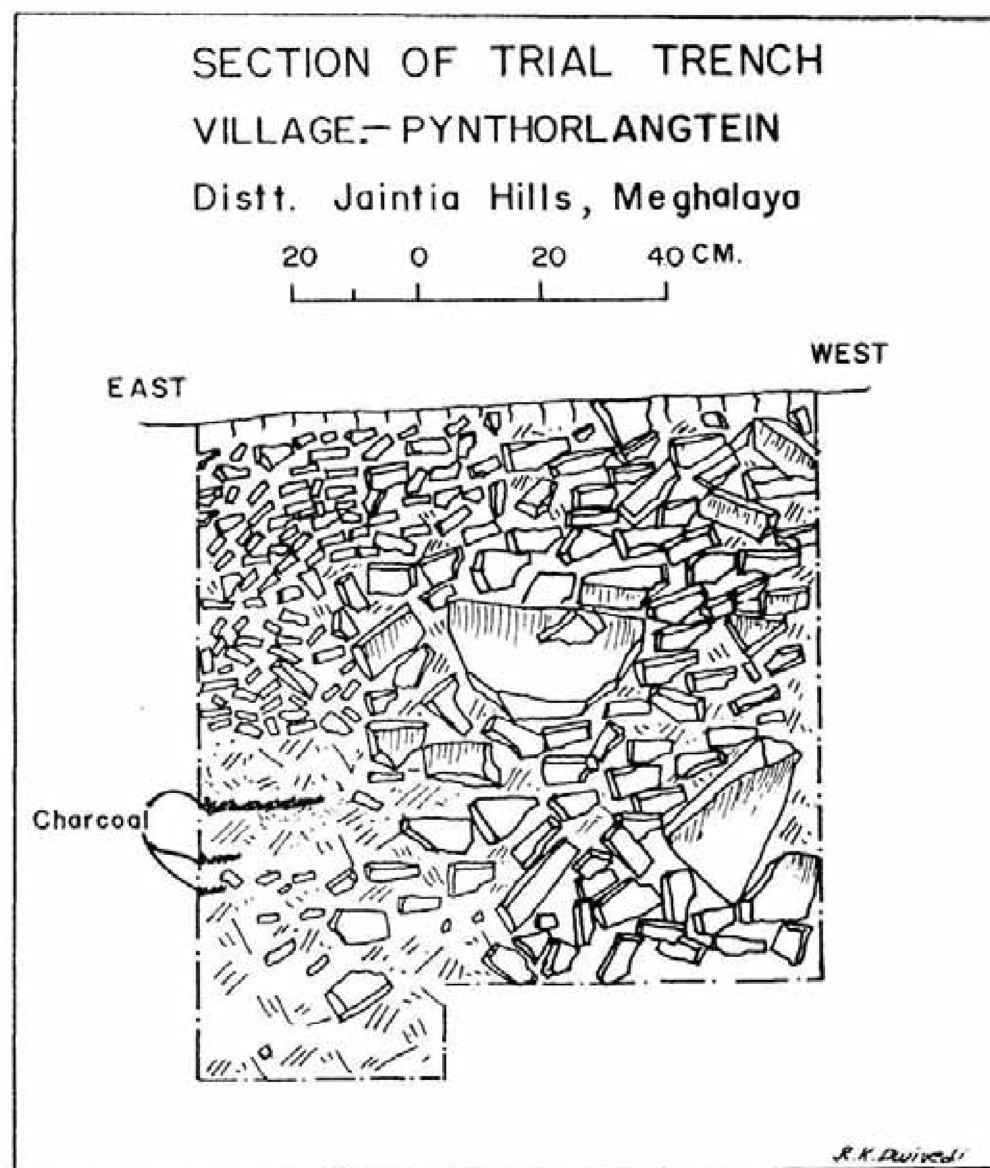

SECTION OF TRIAL TRENCH
VILLAGE.- PYNTHORLANGTEIN
Distt. Jaintia Hills, Meghalaya
20 0 20 40 CM.
WEST
EAST
Charcoal
R.K. Dwivedi

FIG. 18

Village/Site	*Nature of remains*
Bhajamara (25° 43'; 90° 03')	Historical site with a few red ware potsherds and stone pestles
Nalbari (25° 47'; 89° 58')	Historical site (1 sq km) underlying a thick alluvial deposit (0-75 m), semi-course red ware pottery having thin to medium fabric comprising *handi,* jars, small pots and dabber
Rongchugiri (25° 22'; 92° 06')	Stray Neolithic celt

ORISSA

57. EXCAVATION AT BARABATI FORT, DISTRICT CUTTACK.— In continuation of previous year's work *(1991-92,* pp. 83-84) B.K. Sinha of the Excavation Branch IV, Bhubaneswar of the Survey assisted by K. V. Rao, N.K. Sinha, P. Biswas, M.P. Singh, P.N. Biswas and S.K. Bhoi of the branch and I.M. Tikoo and S. Chatterjee of the Headquarters office, carried out excavations at Barabati Fort. The aim of the excavation was to uncover the remains of the Ganga temple (discovered last year) on the western and southern sides; to trace the plastered wall of the northern corridor of the palace on the eastern side and its working level further east; to expose the eastern and western sides on the northern flank of the citadel wall and the Darbar hall down to its earliest working level; and to locate the southwestern corner of the citadel wall and the wall on the western side apart from the stone structures lying in the south of the citadel wall.

Excavations in the northwestern corner in trench YC3, revealed existence of an early layer which yielded potsherds and few pots. Trench YC3 was dug upto a depth of 9.40 m (depth taken from peg YB2) well below the water level. The layer having thickness of 0.60 m was lying 1.20 m above the water table and was embedded with pottery. Pottery recovered from this layer include an unslipped variety of dull red ware, grey ware, blackish grey ware and buff grey ware. The shapes were bowls with nail-headed and flanged rims; basins with outcurved rims, externally thickened and round rims, incurved rims and nail-headed rims; vases with wide mouth, *handis* with square cut rims, everted rims rounded at the top and outcurved rims thickened in the middle. The pottery is early medieval and appears to be roughly contemporary with the temple of Period I.

The platform of the temple, excavated in the previous year was found extending on the western as well as on the southern sides. On the western side the platform was found extending below the Darbar hall of the palace, while on the southern side it was traced across the southern corridor, beyond pillars 6 and 7. The platform was available to a length of 30 m east-west and about 22 m north-south.

The plastered wall, forming the northern corridor of the palace, traced up to a length of 13 m was further traced on the eastern side. Although thoroughly robbed, excavations clearly indicated that this wall joined the eastern flank of the citadel wall, now laying below the PWD quarters on the eastern side.

Convincing evidence was found in trench ZC3 where this wall was traced going below the PWD quarters. Thus the total available length of this wall comes to around 40 m.

.In the central portion of this wall, projecting about 1-6 m to the north, was found a thick patch of lime plaster. This patch of lime plaster was very hard and thick and showed signs of wearing, possibly as a result of human usuage. The southern portion of this plaster, was badly damaged due to stone robbing, the length of the plaster, east-west, measured 5 m.

Underneath this plaster was found a covered drain, the level of which corresponded with the working level of the first phase of the palace. In all possibility this plastered portion marked the threshold of the gateway to the palace, having a width of 5 m. It is thus seen that the plastered wall, having a thickness of 2 m, served not only as the northern wall of the corridor, but also as the northern extremity of the palace with an entrance on the northern side.

Excavation in the Darbar hall of the palace revealed that there was a partition on the eastern side. Two pillars, made of laterite blocks placed at a distance of about 4 m from the row of pillars on the eastern side, formed a chamber (4 X 8 m). These two pillars (38 and 39) like others were built over the platform of the temple of Period I. Excavations further revealed the working level of the palace of phase I, the working level was found about 2 m below the level reached in the Darbar hall earlier.

The dressed sandstone blocks, marking the lining of the floor of the Darbar hall seems to have been extracted from the debris of the temple of Period I. Part of the stones forming the lining of the floor were found interlocked with the pillars of the Darbar hall. Excavations also revealed that the palace had more than two building phases. The pillars of the Darbar hall, of the first phase, available upto 2 m above the floor, have beautiful straight edges. Above 2 m nearly all the pillars show later additions at the top as a result of these additions, the straight line edges do not continue upwards the height of 2 m.

It appears that the floor of the Darbar hall was of mud with an edging of sandstone blocks. The working level of the palace was further confirmed by the fact that it corresponded with the working level of the northern corridor of the Darbar hall and the level of the covered drain, built into the gateway on the northern side.

The second phase of the Darbar hall is represented by the addition of pillars. Pillar 30 of the Darbar hall, Pillars 20 of the northern corridor and 3 and 4 of the southern corridor are the tallest amongst the thirty-nine pillars found in the palace complex and these show three building phases.

Two more pillars (18 and 19) along with Pillars 16 and 17 and plastered wall formed the northern corridor of the Darbar hall. Pillars (18 and 19) with an irregular foundation, were built over the scattered debris of the temple of Period I. From the debris at the bottom of Pillar 18, large number of earthen lamps of different sizes were recovered.

From the filling, inside the Darbar hall, over the floor level of phase I, large number of chunks showing 3 to 4 layers of lime plaster were recovered. Each layer showed separate set of painted designs. This evidence suggests the fact that during phase I, the Dabar hall was plastered and replastered atleast four times, and each time the painted designs were different. Also found, from this filling, were baked clay tiles embedded in huge chunks of lime plaster. These tiles suggested the type of roofing the Darbar hall had in its first phase. The entire span of the Darbar hall seems to have been divided and sub-divided

into very small parts with the help of wooden rafters and beams. Over this divided span, clay tiles were spread and in-between and above the clay tiles lime plaster was applied. Such type of roofs continued to be used in Cuttack city till the first quarter of the twentieth century.

The northern flank of the citadel wall was further traced upto a length of 54 m, east-west. In the northwestern corner two phases of the wall were clearly visible. The two phases are separated by a thick layer of stone chips and rubble. Another wall, 2.5 m wide, was seen butting against the citadel wall of the second phase and going south-wards. This wall was traced upto a length of 5 m, north-south. It was lime plastered on both the sides and was built of laterite blocks with foundation of five courses in which some dressed khondalite blocks were also used. The inner face of the second phase of the citadel wall was traced further north upto 4 m.

In the northeastern corner also, the outer face of the citadel wall showed two phases, the second phase wall was found over the first phase wall. The citadel wall of phase II was built after digging a foundation trench in the preceding strata and the foundation trench of wall, phase I, there were three courses in the foundation. The outer working level of the citadel wall was marked by a straight edge of lime plaster above the fifth course. In all, the wall of second phase had thirteen courses.

The citadel wall of phase I, underlying the wall of phase II also had a foundation trench dug in an earlier layer and was available upto three courses. It is likely that the second phase was built over the top of the first phase wall. The inner face of the wall was also exposed and observations in the limited area showed that the inner face also had two structural phases. The top of the wall showed big gaps due to missing stones which was probably an act of stone robbers.

A wall of later period, butting on the northern side of the northern flank wall of the citadel and running parallel to it and having a steep ramp and lime plastered square areas, possibly for gun emplacements, excavated in the previous year, was traced upto the length of 10 m further east. This wall on the Mahanadi side, seems to have been added by the British, after their conquest of Cuttack in AD 1804. In the northeastern corner this wall seems to have come to an abrupt end. East of this wall, at a distance of about 5 m were found two pillars, 40 and 41, built of laterite blocks and very much similar in appearance to the pillar inside the palace area. These pillars standing to a height of 5.90 m had a gap of 1.25 m between them. Having twenty courses of laterite blocks, these pillars showed three building phases. The role of these pillars *vis-a-vis* the palace complex could not be ascertained.

The southwestern corner of the citadel wall was located in trench XD 4. Due to heavy robbing of stones only three courses of the wall running northwards were traceable. One metre wide foot of the wall on its outer side, which is at a higher level than the lowest course of the wall was also seen going northwards. The entire wall has now been exposed on its southern flank and has a total length of about 75 m.

Excavations in the southwestern part outside the citadel, where some unidentified stone structures were observed in the previous season were continued and an area measuring 28 X 20m was opened. In trench XA 8 were found the remains of a pillared hall. On a platform of laterite blocks, measuring 8 X 10 m were found nine bases of pillars arranged in three rows of three each. All the nine

pillar bases were of white sandstone blocks, and the blocks forming the bases were joined with the help of iron dowels. The hall was reached from the northern side with the help of a ramp, built up of white sandstone and laterite blocks. In the northeastern part of this pillared hall were found dumped huge blocks of white sandstone, possibly debris of early structures.

Broken parts of two pillar bases were recovered from this area. The circular pillar bases had corners carved with two squatting lions having common head.

The pillared hall was so thoroughly stone-robbed that nothing could be ascertained about its superstructure.

To the west of this pillared hall was found a laterite platform butting against it and after running 1.60 m westward it turned north. This laterite platform was traced upto 16 m on the northern side and was found going below the southern flank of the citadel wall. The structure was thoroughly robbed but in some portion an edging of white sandstone blocks joined by iron dowels, sitting over a laterite base was noticed. This edging of white sandstone showed three to four courses consisting of mouldings, which were very much similar to those found earlier in the temple belonging to Period I. Four courses of these mouldings were available in the southern part of trench XB6.

This structure appears to be the base of another ruined temple and together with the adjoining pillared hall formed another temple complex. The date of this complex could not be ascertained but on comparative study it appears to be slightly later than the temple of Period I. The white sandstone blocks used in this complex are smaller and the workmanship appears to be slightly inferior.

Significant finds from the filling in the Darbar hall after phase I, was a piece of a small bowl of Celadon ware and some bowls and flat dishes of Chinese porcelain.

Besides, a good number of damaged stone sculptures were also recovered during excavations which represent inverted lotus pedestals, friezes showing procession of elephants and male and female figurines in sandstone; fragments of squatting lions; and architectural fragments depicting bird and floral motifs. Other antiquities include an iron arrow-head, terracotta animal and human figures carved on a handle and a wheel of schist carved with human figures.

58. EXPLORATION AT KULIANA, DISTRICT MAYURBHANJ.— Exploration at Kuliana and its neighbourhood was carried out by Subrata Chakrabarti of the Department of Ancient Indian History Culture and Archaeology, Visva-Bharati, Santiniketan. The field studies were concentrated around lateritic quarries in Kuliana-Kalabaria complex and along the tributary, namely the Jarali near Bijay-Ramchandrapur and the Ghunturu near Kalabaria of Burhabalang.

The field work showed that the area has a fairly widely developed series of Tertiary marine fossiliferous limestones, designated as the Baripada beds, underlying the Quaternary formations. The occurrence of boulder beds of the formal channel, completely hidden under alluvium and laterite incorporating Lower Palaeolithic artefacts assumes archaeological significance, The Baripada beds have been placed in the lower Pleistocene. Since the extension of the Kuliana sequence of Palaeolithic implements has been well established into the nearby Burhabalang boulder conglomerate bed, the lower limit of the lower Palaeolithic of the area could be the lower Pleistocene.

KulianaanditsneighbourhoodwasarichenvironmentfortheStoneAgehunter-gatherers. Situated within aradius of about 25km from Kuliana, the important sites being Bijay-Ramchandrapur, Damodarpur,

Kalabaria, Kalapathara, Kamata, Kendudiha, Koilisuta, Pratappur, Raghunathpur, Sandim, etc. These sites in relation to the geomorphology of the area can be grouped, *viz.,* (i) sites close to the river, (ii) sites away from the river; and, (iii) sites in the high region.

Artefactual evidences collected here also indicate a full sequence of cultural development from Acheulian to Neolithic during the Quaternary period.

The Acheulian assemblages consist of handaxes, cleavers, choppers, knives, scrapers, flakes, cores and waste material. Within the Acheulian, two distinct stages, i.e., lower Acheulian and upper Acheulian can be recognized.

The Acheulian artefacts recovered from Kamta and Sandim are fresh. These seem to have come out from the boulder beds deposited by former channels and the beds in which tools are found *in situ* are remnant of erstwhile boulder beds of the now defunct streams.

The freshness of the artefacts from these areas suggest that some of these sites are in their primary context. The presence of debitage and roughouts also indicate that these artefacts may have been manufactured in the sites whereform these occur.

At Kalapathara and from the river section sites of the Ghunturu were noticed the presence of Upper Palaeolithic and Mesolithic sites. The Upper Palaeolithic assemblage at Kalapathara includes besides flake tool group, blades and burin tool group and also incorporates a large quantum, infact predominating over finished tools of unfinished products.

The Mesolithic artefacts collected from Damodarpur and Sandim represent backed-blade tools as well as thumb-nail scrapers, borers, etc.

59. EXPLORATION IN DISTRICT SUNDARGARH.—In a recent archaeological exploration conducted by the postgraduate Department of History, Sambalpur University, under Sadasiba Pradhan, assisted by a team of eight students located twelve rock-shelters in Hemgir-Kanika region, adorned with prehistoric and proto-historic paintings and engravings, executed on the walls and the ceilings of the rock-shelters. These rock-shelters are situated in the reserve forests of Chhengapahar and Garjanpahar, within a radius of about 4 km from Kanika in Hemgir tehsil of district Sundargarh.

The painted rock-shelters are locally known by a generic name called *Lekhamoda* meaning *(lekha-* writing, moda-rock-shelter), i.e., rock-shelters with writings. The rocks in this locality are a soft medium-grained sandstone which weathers easily and the weathering has favoured the formation of rock cavities and rock-shelters found in such a geological formation with an ideal eco-system where there is the eternal sky at the top and the perennial streams flowing at the feet of such hills breaking the calm and serene grandeur of the natural atmosphere with its murmuring sound attracted the early man, who had no house of his own to live in.

These paintings are executed in mineral colours in monochrome as well as in polychrome. The pigments used were red (geru-haematite), yellow and white (lime). The paintings include a variety of decorative and intricate patterns, human and animal forms. The intricate and decorative patterns occur predominantly, characterized by geometric shapes like squares, rectangles, circles and semi-circles,

criss-cross, parallel, wavy and oblique lines either in monochrome or in polychrome. The human figures are characterized by their stick-like bodies in dark ochre holding either sticks or bow and arrow belonging to the earlier period. Whereas human figures in white with draperies in light red carrying sword and shield belong to the later period, as stratigraphically the dark red human figures are lying superimposed by the white and light red human figures as evident from the paintings. Another feature which distinguishes the early human figures is the use of a variety of headgears; the most popular being the horned-headgear. The representation of human form is very restricted and of the twelve rock-shelters human forms occur only in three rock-shelters (i.e., Lekhamoda VIII, X and XII) and they formed about seven percent of the total painted forms. The representation of human forms are, however, much cruder than other animal forms and decorative patterns. The animal forms depicted in the rock paintings include deer, humped bull, frog, goat (?), snake, goana, lizard, crocodile (?), peacock, monkey, etc.

Stratigraphically all these paintings belong to three phases, on the basis of their superimposition. The earliest paintings are in dark red and the latest are in white while the yellow paintings are the intermediaries found associated both with dark red as well as with white paintings. The rock-shelters were under occupation by the human beings from a quite early times and continued to be occupied until quite late as suggested by the painted forms and the stylistic evolution of the various forms and patterns. The presence of a number of grinding holes on the floors of the rock-shelter also suggest human occupation of the sites and the food habits of the people in those days. The discovery of a large number of microlithic tools from the rock-shelters alongwith lumps of haematite *(geru)* used as pigment, suggest that the earliest paintings in dark red go back to the Mesolithic or the Middle Stone Age period, i.e., about 5000 years BP. The earlier date is further confirmed by thin white patination which cover these paintings. The white paintings chiefly featured by human figures carrying sword and shield may be assigned to the early historic period, i.e., about 2500 years BP.

RAJASTHAN

60. EXPLORATION IN DISTRICT BHARATPUR.— During the course of village-to-village survey Kanwar Singh of Jaipur Circle of the Survey discovered the following sites of archaeological interest.

Tehsil	Village	Nature of remains
Bayana	Bagrain	Medieval structural remains
-do-	Khankhera	Medieval pottery
-do-	Kharairi	Historical and iron smelting sites
-do-	Seblia	Medieval site and structural remains (nineteenth century)
Rupbas	Barahmafi	Late historical mound with structures
-do-	Chak-Samri	Medieval pottery
-do-	Daulatgarh	Medieval pottery

Tehsil	*Village*	*Nature of remains*
Rupbas	Ghatoli	Architectural members
-do--	Ibrahimpur	Late medieval *chhatri*
do--d	Jugla Patti	Late medieval *chhatri*
o-	Karai	Historical habitation mound associated with faunal remains and a sculpture of Vishnu (twelfth century)
-do-	Khansurjapur	Late medieval pottery
-do-	Khudasa	Medieval site
-do-	Mahal	Mosque and Kos Minar of Mughal period
-do-	Mai	Historical mound and eight fragmentary Brahmanical sculptures (eleventh-twelfth century)
-do-	Mandapura	Step-well (eighteenth century)
-do-	Nagla Radhey	Late medieval *chhatri*
-do-	Pichoona	Medieval temple, Kos Minar (Mughal period) and Haveli early nineteenth century)
-do-	Samahad	Medieval mound, two fragmentary Jaina sculptures, temple remains and architectural fragments (twelfth-thirteenth century)
-do-	Singhawali	Medieval site

61. EXPLORATION IN DISTRICT DHAULPUR. — In continuation of previous year's *(1991* -92, pp. 93-96) work, the Excavation Branch II of the Survey, under the direction of Ram Sharan, assisted by G.S. Gaur, L.S. Mamani, V.P. Verma, Narain Singh, Vinod Kumar and others resumed exploration in the district with a view to know further the archaeological potential of the region and brought to light the following archaeological sites.

	Tehsil	*Nature of remains*
Bari	Bari ka khera (26°40' 30"; 77° 36' 05")	Medieval
do-	Bateswar Khurd (26° 41'07"; 77° 34'50")	Medieval

Village/Site	*Tehsil*	*Nature of remains*
Bari	Bhodiya (Uncha Gaon) (26° 50" 50" ; 77° 33' 45")	Medieval
-do-	Bhola ka pura (26° 34' 00"; 77° 42' 10")	Medieval
-do-	Dhannu ka pura (26° 35' 05"; 77° 41" 10")	Medieval
—do—	Isi pura (Nidhara) (26° 39' 50"; 77° 35' 00")	Early historical
—do—	Khairari (26° 42' 55"; 77° 34' 30")	Medieval
~do-	Khohari (Ibahim pur) (26° 42' 00" ; 77° 35' 05")	Medieval
-do-	Kuhawani (26° 40' 45"; 77° 35' 45")	Medieval
-do-	Nagraj (Bateshwar) (26° 41'30"; 77° 34'50")	Historical and early medieval
	Nakta Kansauti Khera (26° 36' 25"; 77° 37' 35")	Medieval
-do-	Sanaura (26° 38'39"; 77° 31'23")	Medieval
Baseri	Bhuteshwar (26° 42' 50"; 77° 33' 00")	Medieval
-do-	Biliya Khera (26° 54" 35"; 77° 46' 10")	Medieval
-do-	Kankoli (26° 47' 48" ; 77° 43' 45")	Historical and early medieval
-do-	Kota (Mamodhan) (26° 45' 30"; 77° 38' 07")	Medieval
Dhaulpur	Bagcholi (26° 52' 38"; 77° 55' 15")	Historical, early medieval and medieval
-do-	Bajehra (26° 51'50"; 77° 53" 15")	Medieval

Village/Site	*Tehsil*	*Nature of remains*
Dhaulpur	Barawat (26° 48' 44"; 77° 36' 05"	Historical and early medieval
-do-	Baseri (26° 44' 52" ; 77° 32' 30"	Historical and early medieval
-do-	Basai Nawab (Guej) (26° 54' 10"; 77° 46' 45"	Historical and early medieval
-do-	Dobati (26° 48' 22" ; 77° 54' 00"	Historical and early medieval
-do-	Jhor (26° 41'27"; 77° 52'00"	Early historical
-do-	Ladim pur (26° 50'08"; 77° 55" 51"	Medieval
-do-	Mahuri (26° 50" 52"; 77° 53'18"	Historical and early medieval
-do-	Piphera (26° 53'07"; 77° 46'43"	Medieval
-do-	Pilua ka Khera (26° 52' 30" ; 78° 00' 00"	Medieval
-do-	Pipronwa (26° 51'39"; 77° 46'25"	Medieval
-do-	Rajai (26° 35’ 13"; 77° 49'07"	Medieval
-do-	Sakhwara (26° 50'30"; 77° 51'37"	Medieval
-do-	Sarkan Khera (26° 45' 10"; 77° 53' 15"	Medieval
-do-	Singaura Khera (26° 53' 15"; 77° 48' 30"	Historical
-do-	Singaura (Temple) (26° 53' 25" ; 77° 48' 20"	Historical and early medieval
-do-	Sugari Khera (26° 52' 24" ; 77° 46' 12"	Grey ware and medieval

Village/Site	*Tehsil*	*Nature of remains*
Dhaulpur	Son (Sayapur Rakoli ka Khera) (26° 47" 44"; 77° 51'30")	PGW, historical and early medieval
-do-	Thipuri Khera (26° 47" 44"; 77° 50' 47")	Historical and early medieval
-do-	Thipuri Khera (Tehri) (26° 47" 45"; 77° 48'48")	Medieval
Raja Khera	Amar pura (Nandauli) (26° 52' 00"; 78° 04' 00")	Medieval
-do-	Andawa Khera (26° 44' 42"; 78° 05' 00")	Historical and early medieval
-do-	Andawa Gaon (26° 44'28"; 78° 05'45")	Medieval
-do-	Basai Kare Ko Khera (26° 46' 30"; 78° 06' 00")	Historical and early medieval
-do-	Changora (26° 43' 50" ; 78° 30' 00")	Medieval
-do-	Chil pura ka Khera (26° 43' 45"; 78° 04' 27")	Historical and early medieval
-do-	Dalel ka pura (26° 49' 28"; 76° 07' 09")	Historical and early medieval
-do-	Dhara pura (26° 50' 15"; 78° 07" 53")	Historical and early medieval
-do-	Garhi (26° 45" 52" ; 78° 06' 00")	PGW, early historical and medieval
-do-	Gujarapura (Nanooli) (26° 58' 20"; 78° 04' 45")	Historical and early medieval
-do-	Hatwari (26° 51' 09"; 78° 03' 10")	Medieval
-do-	Kailash pura ka Khera (26° 51'00"; 78° 00'20")	Medieval
-do-	Kalua ka pura (26° 50' 30"; 77° 53' 55")	Early medieval
-do-	Karil pur (26° 51'10"; 78° 08'00")	Medieval

Village/Site	*Tehsil*	*Nature of remains*
Raja Khera	Latawari mata (Bintipur) (26° 51'00"; 78° 01'22")	Medieval
-do-	Raina wali mata (26° 47' 15"; 78° 04' 00")	Historical and early medieval

TAMIL NADU

62. EXPLORATION IN DISTRICT CHENGALPATTU M.G.R.— G. Thirumoorthy of the Madras Circle of the Survey noticed the following antiquarian remains during village-to-village survey in the district.

Taluk	Village	Nature of remains
Madurantakam	Avirimedu	Late Stone Age tools, Megalithic stone-circles, Siva temple of late medieval period
-do-	Chinnavelikadu	Durga sculpture (ninth century)
-do-	Darmapuram	Siva temple (sixteenth century)
-do-	Endattur	Late Stone Age tools, Megalithic stone and cairn circles, Vishnu temple (eighteenth century)
-do-	Gurumpiral	Sculpture of a goddess (eighteenth century)
-do-	Kilkandai	Linga and nandi (sixteenth century)
-do-	Melkandai	Linga, nandi and a goddess (seventeenth century)
-do-	Paiyampadi	Megalithic stone and cairn-circles
-do-	Panampattu	Linga and nandi (eighteenth century)
-do-	Polambakkam	Siva and Vishnu temples (seventeenth century)
-do-	Pulikoradu	Megalithic cairn-circles linga and nandi of late medieval period
-do-	Puliyarankottai	Late medieval habitation site, Vishnu temple and Hanuman sculpture (eighteenth century)
-do-	Sirunallur	Megalithic stone-circles
-do-	Sittaravadi	Megalithic stone-circles
-do-	Tennampattu	Early medieval habitation site

63. EXPLORATION IN DISTRICT TIRUVANNAMALAI SAMBUVARAYAR.— The Department of Ancient History and Archaeology, University of Madras, under the direction of K.V. Raman, assisted by his staff and students reported the discovery of a pillar with a defaced inscription in very late characters at Arasam Palayam.

At Vayalathur in front of a ruined Siva temple on the northern bank of Cheyyar river, an inscribed stone slab was found. This uncopied inscription containing twenty-three lines in Tamil language and script is dated in the nineteenth regnal year of Aditya I (AD 890). It records the gift of land to the temple of Vayalanarrur for Sribali.

At Padavedu, Vettaigiri Palayam and Mullandirum archaeological mounds were noticed. In the first two places its thickness was 3 to 5 m while in the last one it was only 1 m. A number of black ware, black-and-red ware, coarse red ware, iron slags, blowing pipes and spouts were collected on the surface. Besides, Padavedu also yielded terracotta figurine and lamps and tiles of Chola period and Chinese pottery.

At Anandapuram a beautiful but ruined apsidal Siva temple datable to early Chola period was found on a hillock called Kailasaparai. It contains a number of early Chola inscriptions and the edifice is covered by fallen debris on the exterior upto its ceiling level.

64. EXPLORATION IN DISTRICT VILLUPURAM RAMASAMY PADATCHIYAR.—Few megalithic burial sites were noticed while exploring the villages Thandavasamudram and Puthurmalai of Gingee taluk. The burial type found at Thandavasamudram is cairn-circle, locally known as *"Valiyar Veedu"*. In Puthurmalai, in addition to the cairn-circles, cist-burials and urn-burials were also noticed.

In the course of preliminary off-shore exploration at Pumpuhar conducted by K.S. Sampath, S. Vasanthi of the Directorate of Archaeology, Government of Tamil Nadu and Gudigar and Sundaresh of National Institute of Oceanography, Goa, collected artefacts of semiprecious stones, *viz.,* carnelian, agate, quartz and pieces of megalithic urn. Besides, a trial excavation at Chinnavanagiri and Periyavanagiri situated just on the seashore revealed ring-wells. The villages explored during the survey were Neidavasal, Manigramam, Pallavaneswaram and Sayavanam. Further, onshore exploration in this area was undertaken along with the off-shore exploration, organized jointly by the State Department of Archaeology in association with the National Institute of Oceanography, during the year under review. This exploration resulted in the discovery of an urn piece decorated with a female motif on the (exterior) of rim portion, from a site called Veerali of Melaperumpallam. Besides, sherds of black and red ware, red-slipped ware and coarse red ware were also collected. Exploration at Thiruvankadu also yielded red wares, decorated wares and urn pieces. The exploration also yielded terracotta bust datable to Sangam age from the sands of Pumpuhar.

Some celts of Neolithic period were collected from Seelamalai and Kullakkombai near Uttamapalayam in district Madurai by Santhalingam of the Directorate of Archaeology, Government of Tamil Nadu.

UTTAR PRADESH

65. EXCAVATION AT JAINAL-NAULA, DISTRICT ALMORA.— The Department of History including Ancient Indian History, Culture and Archaeology, H.N.B. Garhwal University, under the direction of B.M. Khanduri, assisted by R.C. Bhatt, P.M. Saklani, K.S. Negi, J.S. Rawat and J.S. Negi resumed excavation at Baseri falling in the Jainal-Naula complex, located at a distance of 8 km northwards of Bhikyasen. Two types of burials, dolmenoid cist and the urn-burials were exposed.

Partially damaged cist-burial (BSR-8) consists of two long orthostats placed vertically according to the requirement (pl. XXV A). The cist chamber is rectangular on plan, measuring (1.70 X 0.49 m) with two cap-stones, covering the box-like structure. The cist was placed in east-west direction".

The most important discovery of the excavation in BSR-8 is a group of sixteen pots placed towards the western side of the burial. Few bone pieces were also collected from this place. The main cist was divided into two parts and the eastern portion was kept empty while the western part contained a number of pots in it. At least sixteen pots of various sizes, shapes and fabric were discovered from the cist while two pots were found from outside. These include various types of bowls such as, bowls with pedestal-base, miniature bowls, dishes and a vase with mat impression.

The use of river boulders for the protection of the cist was also noticed in the excavation. Big boulders (60 X 55 cm, 85 X 40 cm and 66 X 68 cm) were also recovered from the top of the cist-burial (BSR-8).

Another characteristic find at Baseri is a group of urn-burials. During this year horizontal excavation was carried out in the area with the aim to know the extension of this burial area. The total area excavated in BSR-9 is 9.75 X 5m. The excavation at BSR-9 yielded two stone walls (1 and 2). Wall 1 (3.55m) running north-south was constructed for the protection of urn-burials (pl. XXV B). Four urn-burials 1,2,3 and 4 were laid on the western side of the wall. Wall 2 was constructed at a distance of 1-05 m, away from wall 1. Both the walls are running parallel and it is interesting to note that wall 1 is turned towards west while wall 2 to the east.

The urn discovered from BSR-9 are similiar to those found in earlier excavations. The large sized hand-made jars (56 cm dia) contained mat impressions of ripple marks. Another type of pot-burial is of sturdy or coarse red ware. Besides, the pot 5 is small with a different shape.

There is no evidence of traditional Black and Red ware. The main type of pottery however, represent the tradition of PGW of the Ganga-Yamuna Doab showing it either with grey or red surface but invariably showing grey core. The pots have painted designs like horizontal, vertical and slanting strokes with black rim-bands. Most of the shapes are characteristically akin to the PGW shapes as found in sites like Hastinapura, Ahichchhatra, Jakhera, Thapli, etc., found in association with a variety of red ware.

Apart from these, some pots which were discovered in this year's excavation include red ware bowl with pedestal-base, globular goblet, bowl with incurved body and flat base, concave-sided bowl, etc., comparable with the ceramics found in the cemeteries of Loebanr, Katelai, Timargarha, Zarif Karuna, Balambat, etc., in Swat Valley of Pakistan. Similar types of graves were also located in the Kherai area of Pakistan, which appear to be a secondary burial with a single pot placed at either end of the grave as were found in the Sanana and Baseri burials.

No datable material was, however, found in these burials. But these burials from Kumaon on the basis of ceramic evidence, could be tentatively placed around the beginning of the first millennium BC.

66. EXPLORATION IN DISTRICT ALMORA.—The exploration carried out by the Department of History including Ancient Indian History, Culture and Archaeology, H.N.B. Garhwal University, under the direction of B.M. Khanduri, assisted by R.C. Bhatt, K.S. Negi and J.S. Rawat revealed a number of

Megalithic burials in the district. Pathar Khola 29 km from Jainal on Jainal-Deghat road in district Almora is situated on the right bank of Venu river, a tributary of Ramganga. Two dolmenoid cists damaged due to road construction were discovered here near the road side. This cist laid in north-south direction measures 1.23 X 0.65 m, rectangular in shape contained burial pots on the western side. Two types of stones — schist and quartzite were used in the construction of these burials (pl. XXVI).

TheexplorationatSrikotabout2kmawayfromBhikyasenontherighthandsideoftheroadleading to Bhatronjkhan revealed a dolmenoid cist at a height of about 4,000 ft. This rectangular cist, already exposed and disturbed by the villagers is oriented in north-south direction. The cist (1.20 X 0.55m) is rectangular with a height of about 57 cm. The systematic trial excavation of the cist yielded human bones and a red ware globular goblet. Due to the 1 -32 m thick deposit of mud over the cist, it was not possible to clear the whole cist.

Another important site of Magalithic culture in Almora is Jalali, situated about 26 km from Masi on Masi-Ranikhet road. The exploration of the area yielded a number of cist-burials which were mostly damaged by the villagers. The trial excavation of a partly damaged burial (cist-1) laid in north-south direction indicate that this cist is rectangular on plan (1 .70m X 0.51 m), which yielded some fragments of pottery. Another cist-burial (cist-2) also rectangular on plan (2-25 x 0-57 m) is found covered with cap-stone.

67. EXCAVATION AT SRAVASTI, DISTRICT BAHRAICH.— In continuation of last year's excavation *(1991-92,* pp. 102-104), Excavation Branch III, Patna of the Survey, under the direction of L. C. Singh, assisted by D.K. Ambastha, S.K. Sinha, P.C. Das, Y.S. Nayal and Y.D. Sharma and the Japanese team under Y. Aboshi assisted by S. Hasimoto, M. Farukawa, T. Kaigava, F. Yoneda, M. Hayasi, A. Yesugi, H. Oya and Sarad Pandya (co-ordinator) conducted excavation at Sravasti.

The excavation revealed an almost square raised platform with 15 cm projected plan towards east, leaving both the ends by 25 cm a clear cut sign of approach to the raised platform from east facing the tank (Suraj Kund). The platform raised from layer (3) cutting a foundation pit in layer (4) and (5), filled with brick-bats at the bottom and the foundational part of structures raised with broken bricks have fourteen courses, either to form a square stupa or a platform to install an idol facing Suraj Kund. Only seventeen courses of platform survived showing a regular structural activity. Towards south was noticed a monastery complex.

A well, with its foundation pit was noticed in Qd 3 of the trench YA3. Altogether three rooms in a row were noticed having a narrow gallery in front and a big hall at the back. The central room internally measures 2.80 m X 1.50 m. Whereas the rooms on either sides measured internally 2-10 x 1 -50 m each. The thickness of wall varied from 70 to 90 cm. Towards west of the gallery and the rooms in a row was noticed a cistern-like structure provided with a brick-lined wall possibly for storing water. For most of the structures were of broken bricks or brick-bats. The brick-lined cistern having width of one brick of which only three courses now survived. All these structures are of very late period. The pottery collected from the excavation revealed four periods. Period I is characterized by pre-NBP deposit, marked by burnished grey ware and black and red ware mostly collected from the pit. In Period IINBP which occurs for the first time in layer (5) culminated in the preceding layers (6) and (7). Period III-IV, assignable to the late Gupta and early medieval period however, show no demarcating line.

Entire range of pottery is wheel-turned except the storage jar and basin. The types from the top layers represent vase, storage jar, basin, lipped-bowl and mainiature pots in red ware in coarse to medium fabric, mostly treated with thicker variety of red slip. From the mid level of the site layer (3) and (4) sherds of red ware, thick grey ware and black ware were noticed. The types in red ware are characterized by vase, bowl, dish, lid-cum-bowl and miniature pots. Few decorated sherds with incised and applique rope-designs were also noticed. Varying from medium to fine fabric, the sherds are well fired and treated with self bright red slip. Bowl and dish of grey ware bear a fine fabric. Black ware varies from fine to medium fabric representing vase, bowl and dish were found occurring from layers (5) to (7). NBP and its associated ware such as red ware, grey ware and thicker variety of black-slipped. Both thicker and thinner varieties of NBP were noticed. The types are represented by dish and bowl, dish with incurved rim and flat base and bowl with straight sides, or corrugated rim. In grey ware the type includes bowl and dish along with a few vase. Thicker variety or degenerated black-slipped ware was represented by bowl, dish and vase, storage jar, lid, basin, small size dish while in red ware bowl is the most common type.

A few sherds of burnished grey ware, black and red ware, red ware with burnishing marks were picked up from the early level of the site, but they could not be distinguished clearly from the NBP.

68. EXPLORATION IN DISTRICT BANDA.- V.D. Misra, J.N. Pandey and J.N. Pal of the Department of Ancient History, Culture and Archaeology, University of Allahabad, explored parts of the Vindhyas and the Ganga Valley and discovered the following sites in district Banda.

Karka located in Mau sub-division at a distance of about 100 km south-east of Banda town where remains of a Chandella temple and sculptures of eleventh-twelfth century AD were found.

Dasarathaghat is also situated in Mau sub-division of district Banda at a distance of about 110 km south-east of Banda town. Images of mother goddesses *(yoginis)* with their names inscribed in Nagari characters were discovered.

Another site Chhatnagghat was located on the right bank of the Ganga about 2.50 km downstream from the Sangam (the confluence of the Ganga and the Yamuna). There is an extensive mound at the site. Pottery ranging from NBP to the Gupta period was collected from the site. Terracotta figurines and beads made on semiprecious stones were other important finds.

69. EXCAVATION AT IMLIDIH KHURD, DISTRICT GORAKHPUR.- In continuation of last season's work *(1991-92,* pp. 107-109), the Department of Ancient Indian History, Culture and Archaeology, Banaras Hindu University resumed excavation at Imlidih Khurd (26° 30' 30"; 83° 12-5"), located on the left bank of Kuwana river, a tributary of Ghaghara, about 35 km south of Gorakhpur. The work was directed by Purushottam Singh with the assistance from R.N. Singh and Ashok Kumar Singh.

The main objectives of this year's excavation was to ascertain the cultural sequence noticed during the last season's work; to know more about the pre-Narhan deposits and; to retrieve additional data of archaeobotanical and osteological remains.

Period I designated as pre-Narhan culture was represented by a 25 cm thick deposit laying over the natural soil. The pottery of this period comprised corded ware which is essentially hand-made. The

main types are spherical and pedestalled-bowls, vases with flaring rim and expanding body; *handi*-like, cooking vessels with out-turned rim, constricted neck and expanding body; spouted vessels, etc. The archaeobotanical evidence reveals that agriculture was a stable and rewarding economy during this period. There was abundant occurrence of the remains of cereals and pulses which include rice, barley, two varieties each of wheat and millets comprising jowar millet and pearl millet, lentil, field pea, grass pea, green gram and sesame. Among the fruit remains, mention may be made of jujube, *anwla* and grape. A tentative taxonomic classification of the animal bone shows that the cattle, sheep/goat and presumably pig, had been domesticated during this period. The wild ungulates comprise hog deer and large canid, possibly wolf. The aquatic resources include two species of fresh water turtle, fish of small and medium size and fresh water mollusca. The small find comprise pottery discs, presumably used as play objects.

Period II is marked by the remains of Narhan culture. Two successive mud-floors, several post-holes, silos and ovens mark the structural activities during this period. The characteristic pottery of this period is the white painted black-and-red ware, so well documented at the type site of Narhan. The main types in this ware are several types of bowls, basins including those of lipped variety, dish-on-stand and vases. In the associated black-slipped ware, the characteristic shapes are beaker with external grooves at the waist. A new addition in this ware is the *lota-* shaped vessel which has a globular body, constricted neck and flaring rim with shining black slip at this period. Some of these specimens have vertical linear paintings originating from the rim and going downwards. In the plain red ware of this period perforated bowls with four legs were noteworthy finds. The indeterminate object of baked clay, reported earlier was a significant find of Narhan culture. The small objects comprise bone points, pottery discs, stone and terracotta beads, small beads of steatite and a copper celt. The agricultural economy of the preceding period continue in this period as well which include rice, barley, two varieties of wheat, kodon millet, lentil and chickpea and green gram. Among the fruit remains only *anwla* was represented. The faunal remains of this period comprise domesticated cattle, sheep/goat, horse and dog. The wild fauna comprises bear, hog-deer, spotted-deer and swamp deer. The aquatic resources of the preceding period reoccur in Period II as well, though in a smaller concentration.

Remains of Period III were found to be badly disturbed by present-day agricultural activity in this part of the mound. It is marked by the absence of black-and-red ware and the dominance of r. d ware. The frequency of black-slipped ware increases in this period besides, the occurrence of a few sherds of grey ware and NBP Ware.

70. EXPLORATION IN DISTRICT KANPUR.— R.K. Srivastava and K.K. Singh of the State Archaeological Organization, Government of Uttar Pradesh, under Rakesh Tewari, conducted village-to-village exploration in Musanagar area of the Ghatampur and Bhoganipur tehsils. The exploration covered about seventy villages and brought to light sites of different categories, which have yielded black and red ware, NBP, black-slipped ware, Sunga-Kushana Red ware and medieval wares besides, sculptures, terracottas and architectural members, etc.

From Musanagar were collected sherds of PGW, black and red ware, NBP, Sunga-Kushana Red ware, medieval potteries, several Brahmanical and Jaina sculptures, railing pillars — probably of a Buddhist stupa datable to the first century BC, terracotta seals and images, etc. This extensive mound,

largest in the area, is located on the left bank of river Yamuna. This year's exploration also revealed burnished as well as sturdy black and red ware, plain grey ware, black-slipped ware, NBP and the potteries belonging to the Sunga-Kushana and later periods, alongwith beautifully prepared and ornamented Sunga terracottas. Particularly noteworthy is a Sunga terracotta figure of a dancer for its craftsmanship and artistic depiction.

From village Sultanpur were reported sherds of black-slipped ware and wheel-turned and hand-made red ware. These were collected from a site, locally known as "Panama baba ki dandi".

A stone sculpture of *yaksha* was found in a temple "Thakurji-ka-Mandir" in village Fettepur datable to about first-second century AD. The icon depicted in standing position *(sthanaka mudra)* with his right hand raised upto the shoulder in *abhaya mudra,* holds a *kamandalu* in the left. A number of broken sculptures and architectural pieces were also found from the temple and other places of the village.

From village Pratappur, sherds of NBP, black-slipped and red wares were discovered. Besides, a solitary find of polished stone axe from a place located below a banyan tree is important. An ancient mound located near the village 'Chaparghat' also yielded the sherds of black and red, black-slipped and red wares. The discovery of a terracotta female figure holding a musical instrument in her hand from a village Khirianpurwa with a beautiful head-dress, *kantha-hara* (necklace) and bangles is noteworthy.

From Chaprehata situated about 4 km from Musanagar were reported the discovery of a sculpture of Varahi, decked with *ekavali, chakra kundala,* etc., from a place called Sundari. On its reverse is found a beautiful *kirttimukha.* Alongwith this a red sandstone slab decorated with full-bloomed lotus in a circle and a decorated rectangular stone-slab were also recovered.

The exploration of Nayapurwa, located on the left bank of river Yamuna yielded sherds of black and red ware, black-slipped ware, grey ware, red ware and a few sherds of glazed ware, alongwith a few terracotta figurines.

In addition to the above, following sites were also explored.

Tehsil	*Site*	*Nature of remains*
Bhoganipur	Chaparehata	Decorated railing, bricks and terracotta figurines
-do-	Chaparghata	Remains of late medieval fort Surya
-do-	Gausganj	image of early medieval period
-do-	Halia	Black and red ware, NBP, red ware and medieval sculpture
-do-	Keshwa	Fragmentary sculptures of early medieval period
-do-	Khirian Purwa	Fragmentary sculptures and terracottas

Tehsil	*Site*	*Nature of remains*
Bhoganipur	Krapapur	Fragmentary *suchi-stone* with decorated full-bloomed lotus
-do-	Sultanpur	Medieval site
Ghatampur	Gugua	Remains of late medieval period
-do-	Katar	Stone pillars and socket of Sunga period with an inscription
-do-	Koron	Broken sculptures
-do-	Machaila	Polished stone celt
-do-	Reuna	Image of Yamuna, early medieval period

71. EXPLORATION IN DISTRICT MIRZAPUR.— V.D. Mishra, J.N. Pandey and J.N. Pal of the Department of Ancient History, Culture and Archaeology, University of Allahabad, in the course of exploration located a site 'Nadini Dihi' on the southern bank of the Ganga near Ramghat and collected sherds of NBP, terracotta figurines and a few beads.

72. EXPLORATION IN DISTRICT PAURI GARHWAL.— G.N. Srivastava of Agra Circle of the Survey in the course of exploration noticed the remains of temples datable to ninth-tenth century AD in the Kanvashram area of Kotdwar tehsil (in the revenue *mauza* of Chaukighata), Jagdev hill (in the revenue *mauza* of Mavakot) and Kashirampur-malla (in the Kotdwar town).

Kanvashram is an extensive area and has a wide terrace on the right bank of the river Malini at the foot of a hill range called Padal Pani ki Dhar. In this terrace a number of architectural stone slabs were found exposed in a rain-gulley. Besides, a number of similar architectural stones consisting of *chaitya-gavaksha, sukanasa, rathika* and *amalaka* were noticed lying at Paryatak Avas Griha compound, Vanya Jantu Vihar and at a modern Siva temple. These remains witness an erstwhile existence of a cluster of temples of *nagara-sikhara* type.

A ruined structure (measuring 3.25 X 3.40 X 3 m) built in *lakhauri* bricks and locally available stones at a place called Satimatha about one and a half km further north from the Paryatak Avas Griha, Chaukighata along the river Malini in the interior hilly track was noticed. This structure has elongated arched openings in all the four sides and covered with a domed roof of *lakhauri* bricks laid in radiating pattern. The roof-surface is badly damaged though the ceiling is almost intact with traces of fine stucco plaster. Towards the east of the above structure, remains of wall built in random stone-rubble masonry were noticed in the jungle-cladded hilly terraces. All these structural remains seem to be ruins of some administrative/military establishment of the late medieval period.

A number of architectural stones carved with the motifs and decorative designs typical of the temples of Pratihara period and datable to ninth-tenth century AD were also noticed at Jagdev hill in the vicinity of village Mavakot. These detached architectural members formed the part *of sukanasa* and

jangha portion of temples. A *rathika* (niche fragment) containing the image of standing Ganesa (measuring 55 X 35 X 13 cm) is noteworthy.

Besides, a number of architectural stone fragments which formed parts of some temples of Pratihara period were noticed lying near a huge ditch in the agricultural fields at Kashirampurmalla locality of Kotdwar town.

73. 'EXPLORATION IN DISTRICT PITHORAGARII.— In continuation of previous work, Hem Raj and Suresh Kumar Dubey of Regional Archaeological Unit, Almora, Government of Uttar Pradesh resumed village-to-village exploration in tehsil Champawat.

About three hundred and one villages and their hamlets were explored under the revenue circles of Sal, Chaurapitta, Parewa, Bhaginakhet, Bapru, Mau, Dyartoli, Chaupta, Khatera, Rausal, Dhaun, Kotkendri, Khilpati, Jakh, Balson, Sookhidhang, Riyansi, Reoiyan, and Bakora. Archaeological remains were noticed in thirty-four villages. Stone sculptures of Parvati, Surya and Uma-Mahesa datable to tenth century were found at Chimoli village near Reetha Saheb. Many Veer-khambs were located in Machhiyar, Chalthiya, Boharabagar, Kairagaon, Goludada, Narisaira, Vaila, Thoom, Hingolachour, Chhandaregadu and Dhaunisilang villages. Veer-khambs discovered from Chhandaregadu and Dhaunisilang villages are inscribed. Water reservoirs *(naulas)* were also located at Kuliyal, Mangallekh, Jankande, Lunghar, Mangoli, Malla-Bapru, Bantoli and Mar-chamar villages. Two *naulas* found from Mangoli and Mar-chamar contain dated inscriptions Saka 1392 (AD 1470) and 1369 (AD 1447) respectively. Beside these, the ruins of fort of medieval period was noticed at Galpa village. From village Raja-Khali, brick-bats and red-ware belonging to the medieval period were reported. Medieval temples of *nagara* styles were located at Dhaunisilang, Chami, Mau, Dyartoli, Chilkot and Khatera. Stone sculptures of seshasayi Vishnu, Surya, Mahishamardini, Ganesa, Vishnu, Balarama, Lakshmi, veenadhara Siva, Varahi, *Navagraha* panel, *Sapta-matrika* panel and *ekamukha Siva-linga* datable between ninth and fourteenth century AD were discovered at Pancheswar, Pasela, Maura, Chami, Devalgad, Chhandare, Rausal and Mosta respectively. The most remarkable sculpture brought to light is an inscribed stone sculpture of Mahishamardini found from Chami village near Chaumel. Beside this, a terracotta pipe-line belonging to medieval period was recovered from Chaumel village. A copy of copper-plate found in a private collection in village of Pasela (Mar), bears date in Saka era 1399 (AD 1477) and belongs to king Bharti Chandra.

74. EXPLORATION IN DISTRICT SULTANPUR.— In the course of exploration under village-to-village survey, Indu Prakash of the Lucknow Circle of the Survey noticed the following sites.

Village/site	*Tehsil*	*Nature of remains*
Bagahi	Musafirkhana	Mound yielding red ware sherds of medieval period
Gadariadih	-do-	A ruined brick temple of eighteenth-nineteenth century, stone image of Surya worshipped as Devi assignable to tenth-eleventh century

Village/site	*Tehsil*	*Nature of remains*
Sathin	-do-	Two mounds, one with pottery ranging from NBP to late medieval period while the other has pottery assignable to Kushana period to. late medieval period

75. EXPLORATION IN DISTRICT PRATAPGARH.—H.K. Narain assisted by R. Pathak, Indu Prakash, S.B. Shukla and Dinesh Goswami of Lucknow Circle of the Survey carried out explorations along the left bank of Sai river in district Pratapgarh and brought to light a number of habitational sites ranging from early historical period to the medieval period. Besides a large number of stone sculptures ranging from post Gupta period were also found in the renovated brick temples. The sites are as under.

Village/Site	*Nature of remains*
Adampur	Mound yielding late medieval pottery
Baijalpur	Mound yielding medieval pottery
Bhojpur	Kot/mound yielding medieval pottery and stone sculptures of Vishnu
Bikrampatti	Mound yielding medieval pottery
Chaukhar	Stone *argha* kept near a pond
Dharampur Sirkhori	Mound yielding medieval pottery
Dhaurahra	Mound yielding medieval pottery
Dhikahi	Fragmentary stone sculptures
Garha	A huge mound yielding NBPW and other associated remains
Gauradand	temple containing fragmentary stone sculptures of medieval period
Gonde	Early historical site/stone sculptures and architectural fragments affixed to a late medieval temple
Isipur Khas	Mound yielding medieval pottery
Lohangpur	Mound yielding medieval pottery
Nawada	Mound yielding early historical pottery and stone sculptures
Nawada Kalan	Mound yielding medieval pottery
Pure Tularam	temple containing fragmentary stone sculptures of medieval period

Village!Site	*Nature of remains*
Rajapur Kalan	Mound yielding medieval pottery
Sandwa Chandika	Late medieval temple with stone sculptures of medieval period
Sangrampur Quila	Mound yielding late medieval pottery
Sarwa	Kot/mound yielding late medieval pottery

76. EXCAVATION AT SARNATH, DISTRICT VARANASI.— A.K. Sinha assisted by B.R. Rajput of the Headquarters office of the Survey carried out trial excavation at Sarnath with an objective to know its antiquity.

Two squares, measuring 5m X 5 m were laid towards the rear of the apsidal structure with a part of it lying inside the trench.

Immediately after removing the top. soil (humus), which was free from artefacts, red ware ceramic industry roughly belonging to post-Mauryan and pre-Kushana periods, were encountered. It was also revealed that the apsidal structure had originally of two courses height, when excavated in 1913-14. The height of the structure was raised by adding five more courses of fresh bricks, keeping in view the preservation of the structure. Interestingly, while digging in the northwestern square, it was revealed that the apsidal brick structure was originally mud plastered (about 10 cm thick) from outside with outermost coat of lime. It was noticed that the application of lime coating was carried out at regular intervals. At least four coats of lime could be noticed. On an analyses and study of the ceramics, recovered from layer (2) prior to the construction of apsidal structure, it was observed that the apsidal temple was most likely built during late-Mauryan period. The ceramic industry representing the level included plain grey ware, few sherds of black-slipped ware and plain red ware. However, no sherd of NBP was encountered.

From layer (3) were found grey and black-slipped ware in good quantity. Amongst the red ware, variants of Ahichchhatra 10 A and miniature bowls associated with NBP were the significant finds. However, discovery of a few NBP sherds of jet black and silver hue from this level is worthy of special mention.

While digging in the southwestern square, it was observed that the apsidal temple was raised on a very strong foundation. The brick masonry was raised over a thick bed of rammed burnt brick-bats, which possibly served as a strong foundation to accommodate the load not only of the walls but also of the roof which was perhaps tiled (fragments of terracotta) tiles, too, were recovered during the excavations from layers (2).

While digging inside the apsidal structure, in a very restricted area, large sized bricks (44 X 36 X 5 cm) and brick-bats pavement, at a depth of about 10 cm from the present ground level, was exposed.

A small trial trench measuring 2m x 2m was taken exactly at the centre of the Asokan pillar and the apsidal structure. The upper levels upto a depth of 30 cm, layers (1) and (2) yielded post-Mauryan

red ware, in a very limited quantity. The layer (3), however, yielded plain grey, black-slipped and plain red ware. Preliminary study of the ceramic industry indicated that the pottery recovered from layer (3) of the trench roughly corresponds with the pottery datable to *circa* third-fourth century BC.

Preliminary studies of the ceramics recovered from various levels of the trial trenches dug in the western part of the ancient site of Sarnath, indicated that the antiquity of the site may not go beyond *circa* third-fourth century BC. The recent work could also confirm that the apsidal structure was built sometimes in late-Mauryan period, i.e., *circa* third-second century BC.

WEST BENGAL

77. EXPLORATION IN DISTRICT BANKURA.— T.J. Chakraborty of Calcutta Circle of the Survey during the course of village-to-village survey discovered the remains of following ancient temples.

Police Station	*Village/Site*	*Nature of remains*
Bankura	Mankanali	Late historic *pancharatna* brick-built temple and *rasmancha*
-do-Joy	Rayband	Late historic temple
pur	Joypur	Laterite foundation indicating the base of an ancient structure.

78. EXPLORATION IN DISTRICT MIDNAPORE.— Santanu Maiti of Calcutta Circle of the Survey discovered the following ancient temples and sites during the course of village-to-village survey in Midnapore district.

Police Station	*Village/Site*	*Nature of remains*
Bhagwanpur	Bartan	Late medieval site
-do-	Khaga	Late historic temple
-do-	Kishorepur	Late historic deity and terracotta figurines
Bhupatinagar	Baghadanri	Late historic temples

The Directorate of Archaeology, Government of West Bengal carried out an exploration in the eastern flank (mid-stream) of Suvarnarekha valley and its tributaries like Dulong, Simona, Kopan and Palpala under the direction of S. De and assisted by S. Chakraborty, D. Roy, B. Bhattacharyya and Ajoy Singha. In the course of exploration following three terraces were noticed.

The high land Terrace I at Bhagaband (9km south-east from Belpahari) shows the morphostratigraphy from the surface level, which consists of older alluvium of coarse sand and pebbles. Towards the slope of the ground surface, lower palaeolithic handaxes were collected. The presence of denuded lateritic rock with occasional intrusion of granitic gniess and quartz being the underlying formation breaks the monotony of the older alluvium. The older alluvial bed represents the middle palaeolithic horizon with the occurrence of Middle Palaeolithic handaxes, scrapers and waste cores and flakes.

Terrace II, at Charchaka, near Simona-Dulong confluence - the younger alluvium, composed of silty loamy soil, is overlain with the older alluvium of coarse grained sand. The underlying deposit is of compact pebble bed with coarse grained sand lying on the above pebble deposit. Some upper Palaeolithic tools, *viz.,* points and blades were collected from the surface of flood-plain.

Terrace III, at Maluismura is located near the confluence of Dulong-Papala river. The surface is of recent alluvium of loamy soil, overlain with old alluvium deposit of coarse grained sand and occasional pebbles. The underlying deposit of boulder conglomerate is lying above the bed-rock.

The total picture of climate and cultures started from lower Pliestocene (boulder conglomerate) and continued upto mid-Holocene. The climatic fluctuations had alternately major to medium and minor fluviatile effect on these deposits, thereby effecting in cultures where heavy and large lithic tools ranging from light to small, were used.

79. EXPLORATION AT DHULIAPUR, DISTRICT MIDNAPORE.— The Directorate of Archaeology, Government of West Bengal under the supervision of S. De assisted by P.C. Sen, D. Roy, D. Chakraborty and M. Bhowmik carried out trial digging at Dhuliapur (22° 31' 30" ; 86° 31'), lying on the right bank of Tarafeni in Chotanagpur plateau, to determine the nature of cultural deposits ranging from prehistoric to the early historic times. Earlier explorations of the site by the Directorate yielded a variety of artefacts from the lower Palaeolithic to Neolithic as also of the early Iron age from the high land and the peneplain of the Tarafeni valley. The Chalcolithic site of Sijua is also not far from the confluence of the Tarafeni-Bhairabbanki.

The archaeological site of Dhuliapur is unique in as much as it yielded not only the stone artefacts of different ages but also a rich variety of different kinds of rocks - archaean granite, gneiss and ironite. Late Tertiary, Pliestocene, Holocene deposits ranging from boulder beds, lateritic gravels, reddish yellow, brown, red and dark soil and even recent alluvial soil were noticed here. The age of the artefacts range from 0.1 million to 0.001 million years (approximately). The morphostratigraphic unit of this place similar to those observed in other contiguous areas like Sijua and Laljal developed over riverine boulder conglomerate of early to middle Pliestocene and lower Palaeolithic artefacts and animal fossils were found within primary laterite boulder conglomerate. The overlying sediments of the boulder conglomerate represents the oldest riverine terrace surface, developed extensively during late Pliestocene to early Holocene and is represented by upper Palaeolithic and Mesolithic artefacts. This is further overlain by alluvium over riverine terrace sediments of middle Holocene and is represented by Neolithic and early Iron age artefacts, etc. Dhuliapur situated on the meandering course of Tarafeni in its mid-stream, developed river terraces. The exploratory works were concentrated in two patches of the site, i.e., DHLPR-I and DHLPR-3. At DHLPR-I, where layers 2 and 3, mark the early Iron and Neolithic deposits. The former js medium, compact soil (40 cm thick), brown in colour while the latter is more compact, reddish yellow soil. Layer 2 representing early Iron age levels yielded profuse quantity of iron slags and varieties of iron implements like nails, spear-heads, arrow-head, blade and dagger (broken) alongwith lump of burnt clay and potsherds of sturdy red ware and grey ware (bowls and dishes etc). Layer 3 represents Neolithic level (2.5 m) which yielded potsherds (bowls and vessels) of dull red ware and a single piece of Neolithic celt of fine grained sandstone.

At DHLPR-3, near the DHLPR-1 was noticed four ovens in completely worn-out condition (at a depth of 2 m from surface) with traces of burnt clay, ash and charcoal at the oven base. The major part of this habitation level was washed away by fluvial action.

Fossils of mammals representing long bones, skull cap with maxila were recovered from late Pliestocene/Upper Palaeolithic stratum.

The phenomena of regular climatic fluctuations as well as the marks of intensity of humid and arid conditions, could be noticed clearly in the morphostratigraphic section of the site where agradational and degradational activities of the river have formed terraces.

80. EXPLORATION AT SAIIARI, DISTRICT MIDNAPORE.— An extensive but highly eroded site due to seasonal rains, situated (86° 47' 44"; 22° 37' 33") about 4 km away to the west from the Silda Market and nearly 4 km south-west from Belpahari, was explored by Atul Chandra Bhowmick of the Department of Museology, University of Calcutta. Five cordiform handaxes, of which one is very typical and unique, five lanceolate handaxes with broad and thick butt-ends, two scrapers, one cleaver, five bolas together with one point and some flake tools, most outstanding, were collected as surface finds. These artefacts of the lower and middle Palaeolithic periods, were found scattered on the higher elevated level as well on lower gradient of the secondary lateritic bed. Quartz and quartzite were utilized as raw materials for shaping the tools. The tools are slightly brown, patinated and some having brown accretions too.

81. EXPLORATION IN DISTRICT 24 PARGANAS.— Samar Ghosal of the Calcutta Circle of the Survey discovered the following ancient temples and sites having archaeological importance during the course of village-to-village survey in district 24 Parganas.

Police Station	*Village/Site*	*Nature of remains*
Patharpratima	Chhota Rakshas Khali	Potsherds, brick-bats and terracotta figurine belonging to Gupta period
-do-	Gobindapur	Damaged structure of historic period
-do-	Kshetramohanpur	Brick structure of historic period

II. EPIGRAPHY

SANSKRITIC AND DRAVIDIC INSCRIPTIONS[1]

ANDHRA PRADESH

1. VIJAYANAGARA INSCRIPTION, CHANDRAGIRI, DISTRICT CHITTOOR.— This Telugu inscription, engraved on a small stone found near a sluice in the village, is now preserved in the Archaeological Museum at Chandragiri in district Chittoor. Dated Saka 1526 (AD 1604), the record belongs to the Vijayanagara king Venkatapatiraya and registers the gift of *kshetra-kallu* to the god (name not mentioned) by Papirayani, the *karyakarta* of Chennappa-nayani, the *dalavayi* of the king.

2. BRAHMI INSCRIPTION, AMARAVATI, DISTRICT GUNTUR.— This inscription, on a sculptured slab originally discovered in the village Dharanikota, is now kept in the Archaeological Museum, Amaravati. It is in Prakrit language and Brahmi characters of about the second century AD. It reads *amacha bhariyaya chhaya thabo,* meaning that this memorial pillar was erected in memory of the wife of a minister.

3. KALYANI CHALUKYA INSCRIPTIONS, KURUMIDDA, DISTRICT MAHBUBNAGAR.— Of the two Kannada inscriptions, engraved on a stone pillar outside the village, the first one belongs to the reign of Kalyana Chalukya king Trailokyamalla (i.e., Somesvara I). Dated Saka 968 (AD 1046), it gives the eulogy of his chiefs Bijjamarasa, *Yuvaraja* Sankarasa and *Kumar a* Nanemarasa and records the gift of the village Tala Kurumudde in Koluru-300 division to *mane-verggade* Kuchimayya as an *agrahara* by *mahamandalesvara* Bijjarasa and others on the occasion of solar-eclipse. The gift was made while the chiefs were camping after the release of the fort of Pannala.

GUJARAT

4. PILLAR INSCRIPTION, PATAN, DISTRICT MAHESANA.— The stone inscription in Sanskrit language and Devanagari script belongs to Vastupala, the famous Mahamatya of Virdhavala of Waghela dynasty. Dated AD 1228, it refers to Vastupala as the son of Asairaja and Kumardevi of Pragavata *gotra,* residing at town of Srimatapattan. Vastupala is described as *Samghapati* and *'Maham'* which stands for *Mahanta.*

5.COPPER-PLATE INSCRIPTION, DHANK, DISTRICT RAJKOT.— A copper-plate inscription belonging to the reign of king Siladitya V, Maitraka of Valabhi was discovered while digging foundation for the

---

[1]Information from: 1-3,6 and 9-23, M.N. Katti, assisted by M.D. Sampath, M. Jayarama Sharma, T.S. Ravishankar, C.A. Padmanabha Sastri, D.M. Nagaraju, S. Nagarjuna, S. Swaminathan, Jai Prakash, K. Karuppaiah and S. Rajavelu of the Epigraphy Branch; 4-5, Vadodara Circle; and 7-3, Bhopal Circle of the Survey.

house at Dhank in taluk Upleta. It records the royal grant of some of the plots of land in Saurashtra for performing certain prescribed religious rites to the Brahmana donee Brahambhatta, whose fore-fathers originally hailed from Pundra-Vardhana (Bengal) and who was a resident of Prabhas Somesvara (Prabhas Patan).

KARNATAKA

6. KALACHURI INSCRIPTION, BADAGI, DISTRICT BELGAUM.—This Kannada inscription, engraved on a slab set up to the left of the Kalmesvara temple belongs to the reign of king Bijjala of the Kalachurya dynasty. Dated in his eleventh year (AD 1166), it records the grant of garden and wet lands at Kogatanur for worship and offerings to the deity Lakshmesvara by Chauda-bhattopadhyaya and his sons Chakribhattopadhyaya of Badigi with the permission of Mailugideva. Also it registers a gift of twenty *mattar* of lands, house-site and oil-mill to the deity and four *mattar* of lands to the brahmanas. The record states that Revarasa was ruling from Tungala—12 division and gives the genealogy of this chief.

MADHYA PRADESH

7. VOTIVE INSCRIPTION, SATDHARA, DISTRICT RAISEN.— Votive inscriptions in Brahmi characters of Sunga period bearing the names of monks, citizens, etc., who donated the *sue hi, vedika* pillars and stone slabs of *pradakshinapatha,* etc. to the stupa were found (pl. XXVII).

8. DEVANAGARI INSCRIPTIONS, BERHAT, DISTRICT REWA.— Two inscriptions in Nagari characters were noticed in two different rock-shelters. One of them is a three-lined inscription (VS 1309) below which is carved the figure of a warrior with shield and sword (pi. XXVIII A).

9. PILLAR INSCRIPTION, GUDARA, DISTRICT SHIVPURI.—This inscription, engraved on a stone pillar found near Durgamata-mandir, is in corrupt Sanskrit language and Nagari characters. Dated Vikrama 1292 (AD 1235), it states that this is the hand *(hasta)* of Tamaga, who is described as *kuladipaka* of the Jata family.

10. INSCRIPTION, GUDARA, DISTRICT SHIVPURI.— This inscription, engraved on a sati-stone, is in local dialect and Nagari characters. Dated Vikrama 1878 and Saka 1743 (AD 1821), the inscription records the act of *sahagamana* (i.e., *sagauna)* by the wife of Lala Kataipala, son of *pam* Tivari Gokunadasa.

RAJASTHAN

11. INSCRIPTION FROM CHITRI, DISTRICT DUNGARPUR.— This inscription, engraved on a pillar at the entrance of Mahadeva-mandir, is in Sanskrit language mixed with local dialect and Nagari characters. Dated Vikrama 1314 (AD 1257), it refers to the renovation of a Siva temple *(Siva-sadma)* by Kumara, son of *sam* Chajarana in the Chitaliya village.

12. INSCRIPTION OF THE RULER OF DUNGARPUR, GALIAKOT, DISTRICT DUNGARPUR.— This Sanskrit inscription in Nagari characters, is engraved on a slab built in the wall of a Jaina temple. Dated Vikrama 1632 (AD 1575), it belongs to the reign of king Asakarana and records the construction of the central shrine in a Jaina temple *{Jina-prasada)* in the Kotamahadurga (Galiakot) by Dosi-puja, his sister Kohi

and other members of the family belonging to *Hubada-jnati* and Uttaresvara-gotra and residents of Giripura.

13. INSCRIPTION OF THE RULER OF DUNGARPUR, DISTRICT DUNGARPUR.— This inscription, engraved on a slab built into the wall of a Jaina-mandir, is in Sanskrit language and Nagari characters. It belongs to the reign of king Sahasamalla of Vagvaradesa and is dated in the Vikrama year 1637 (AD 1580). It records the construction of a temple *(prasada)* of the deity Vasu by Bha. Devalade and others belonging to Kotamaha-durga (Galiakot) of *Nagadra-jnati,* Vriddha-sakha and Kasapa-gotra (i.e., Kasyapa-*gotra).*

14. INSCRIPTION OF THE RULER OF DUNGARPUR, THAKARDA, DISTRICT DUNGARPUR.— This Sanskrit inscription in Nagari characters, is engraved on a slab built into the wall of Siddhesvar Mahadeva-mandir. Dated Vikrama 1483 (AD 1426), it gives the eulogy of king Gopinatha, the son and successor of Pratapa-simha, who belonged to the family of Shumana-vamsa, and was a descendant of the Guhadatta family. It states that he got a temple *(prasada)* raised to the deity Siddhanatha.

TAMIL NADU

15. KONGU-CHOLA INSCRIPTION, KADATTUR, DISTRICT COIMBATORE.— This Tamil inscription, engraved on the south wall of the central shrine of Konganesvara temple, belongs to the Kongu-chola king Virarajendra. Dated in the fifteenth+fifth year (AD 1226-27) of his reign, it states that one of the ascetics residing in the quarters around the temple of Tirumarududaiyar of Kadarrur made endowment of lands at Solamadevi purchased with sixteen *achchu* borrowed for maintaining a perpetual lamp to the deity Kongavitankisvaram-udaiyar.

16. WESTERN GANGA INSCRIPTION, PALAIPETTAI, DISTRICT DHARMAPURI.—This Kannada inscription, engraved on a rocky outcrop in the village, is in characters of eight-ninth century AD. It belongs to the reign of Western Ganga king Sripurusha Ereyappor and seems to record the grant of lands, two garden lands and a house-site as *devabhoga,* to a Jaina ascetic Viradeva of Virasamgha-gana.

17. TAMIL INSCRIPTION, DHARMAPURI, DISTRICT DHARMAPURI.— This Tamil record, engraved on a stone set up in a field by the side of the road leading to Adiyamankottai, can be palaeographically assigned to twelfth century AD. It refers to the distance from the stone to Navaratavalam was twenty-nine *kadam* in the highway called *Adiyamanperuvali.* The numeral is indicated by scooping of two big holes after the number twenty-nine and nine small holes in three rows of three each.

18. PALLAVA INSCRIPTION, VELLORE, DISTRICT NORTH ARCOT.—This Tamil hero-stone inscription, originally found at the village Melsanankuppam, belongs to the reign of Pallava king Nandivikramavarman and is dated in the twelfth year (AD 743) of his reign. It records the death of a certain Vinaiyittan, son-in-law of Banamuttaraiyar while he was in the horse during the attack of Visaiyadattan *alias* Kampadigal over Murungai in the battle field of Punnera. It further registers the gift of lands as *mindalpatti* and chemmarpatti to the members of the deceased family.

19. LABEL INSCRIPTIONS, SITTANNAVASAL, DISTRICT PUDUKKOTTAI.— Seven label inscriptions in Tamil language and Vatteluttu script are found engraved on a boulder near the natural cavern with

inscribed beds in a row called *Eladipattam.* These records are palaeographically assignable to late fifth to late or early seventh century AD. These inscriptions refer to personal names like - Chattan, Chennan Kanan, Pentotan, Nakkan, Korraikayvan, Manchennatan, etc.

20. CHOLA INSCRIPTION, AVIYANUR, DISTRICT SOUTH ARCOT.—This Tamil inscription, engraved on a stone set up in the Perumal temple, belongs to the Chola king Maduraikonda Kopparakesari (i.e., Parantaka I). Dated in the thirty-first year (AD 938) of his reign, it records the grant of several lands, made after purchase for a price-value of twelve *kalanju,* by the *sabhai* of Aviyur, to the temple of Jalasayanadevar of the same village. In continuation of the above record, there is a record of the Chola king Kalamarutta Ko-Rajarajakesari attesting the renewal of the earlier grant and making it free from taxes *(iraiyili)* to the same temple by the *mahasabhai.*

21. CHOLA INSCRIPTION, TITTAKUDI, DISTRICT SOUTH ARCOT.— This Tamil inscription, engraved on the wall at the entrance to Vaidyanathasvami temple belongs to the reign of Chola king Rajaraja. It states that a merchant of Sirukannamangalam in Urayiur-nadu named Ennariyan Nadaripugali got the images of god and goddess reinstalled in the temple of Urudaiperumal at Tittakudi *alias* Tiruchchirrambalach-chaturvedimangalam, which were lifted from the temple after the destruction of the temple by Vallaladevan (probably Hoysala Ballala). It is stated that the celebration of festivals came to a standstill on account of this act.

22. CHOLA INSCRIPTION, GOPURAPPATTI, DISTRICT TIRUCHCHIRAPPALLI.- This Tamil record, from the Avanisundaresvara temple, belongs to the Chola king Rajaraja I and is dated in the twenty-first year (AD 1006) of his reign. It refers to the order issued by the revenue officer *(vagai-seginra)* named Avanam-udaiyan Mattandan, *alias* Uttaman of Rajasraya-valanadu, to the land allottees of the temple of Amalisvarattudevar of Pachchil, who had been enjoying the temple lands in the villages Korrankudi and Bananallur. They have to measure paddy out of their land shares allotted to them. It also records that provision was made to feed thirty brahmanas and ascetics on the occasion of the birth star Avittam, on which day Kundavai-pirattiyar was born. She is described as one who was born prior to Rajarajadevar on the above day.

UTTAR PRADESH

23. COPPER-PLATE INSCRIPTION, JHANSI, DISTRICT JHANSI.— This copper-plate grant, originally found at Ujjain, Madhya Pradesh, is now in the possession of Mohanlal of Jhansi. This incomplete charter written in Sanskrit language and Nagari characters belong to the reign of Paramara king Bhoja. Dated Vikrama 1080 (AD 1023), it records the grant of lands measuring ½ *kralaka* for the worship and offerings, ½ *kralaka* (for providing alms) to the teacher Vidyachakravarti-bhattaraka and one *kralaka* towards day-to-day provision of materials for worship, timber, leaves, etc. (for the purpose of offering food) to the temple of the deity Mahakaladeva, evidently of Ujjain. The gift was made by the king on the occasion of lunar-eclipse, for the merit of his parents and his own self.

ARABIC AND PERSIAN INSCRIPTIONS[1]

BIHAR

1. MISCELLANEOUS INSCRIPTION, SEMRI BAKHTIARPUR, DISTRICT SAHARSA.—This undated metrical epigraph, executed in Nasta'liq characters, records the construction of a mosque by a pious lady, 'Azimu'n Nisa by name.

KERALA

2. MISCELLANEOUS EPITAPHS, ALLEPPEY, DISTRICT ALLEPPEY.—These epitaphs which constitute beautiful calligraphical specimens, mention the names of certain eminent religious businessmen including ladies who had performed *Hajj* (i.e., pilgrimage to Mecca and Medina). The departed souls, referred to in the inscriptions, belonged to one and the same family that had migrated from the Kutch region of Gujarat to Kerala and settled there for commercial activities. Among the deceased are: Sayyid Ahmad, son of Makki al-Mahdi, a venerated saint (AH 1225/AD 1810); Asiya Ba'i, daughter of Haji Yusuf, son of Nur Muhammad (AH 1289/AD 1872); Gul Muhammad, son of Haji Musa (AH 1291/ AD 1874); Maryam, daughter of Haji IIyas, son of Haji Yusuf, (son of) Nur Muhammad (AH 1310/AD 1892); Khadija, daughter of Haji Muhammad, son of Haji Ya[1] qub, son of Haji Yusuf, son of Nur Muhammad (AH 1314/AD 1896); Hajjiyani Zulekha Ba'i, daughter of Haji Allah Rakhiya, son of Haji Pir Muhammad (AH 1315/AD 1897); Haji Muhammad, son of Haji Ya' qub, son of Haji Yusuf, (son of) Nur Muhammad (AH 1315/AD 1897); Haji Hashim, son of Haji 'Isa, son of Salih Muhammad (AH 1315/ AD 1897); and Hajyayin Hasina Ba'i, mother of Haji Ya' qub (AH 1315/AD 1897).

UTTAR PRADESH

3. MISCELLANEOUS INSCRIPTIONS, DISTRICT ALLAHABAD.— Among the several inscriptions copied from Damgarh, chronologically speaking, the first one is an epitaph inscribed in Nasta' liq characters, recounting the death and burial of a sufi saint Hadrat Shahinshah Qalandar in AH 1168 (AD 1755). The second inscription, again an epitaph, speaks about the demise of another saintly personage and *qutb* (Pole-star) of his time, Sayyid Basit 'Ali in AH 1196 (AD 1781-82). The third one is a metrical record in Persian, assigning the construction of the tomb of Basit 'Ali (referred to above), and a mosque near the said tomb in AH 1198 (AD 1783-84) to Raja Tikait Rai, a generous personality and an admirer of saints and savants. It is an important record, showing thereby an example of religious toleration and communal amity. (The last two inscriptions were referred to by A. Fuhrer in *The Monumental Antiquities and Inscriptions in the North-Western Provinces and Oudh, reprint, Varanasi,* 1969,p. 143). The last inscription of this group recounts the death of a saintly figure Hadrat Shah Mas'ud 'Ali Qalandar in AH 1221 (AD 1806), aged 56 years.

---

[1]Information from: S.S. Hussain, assisted by M. Quddusi, I. Quddusi, G.S. Khwaja and M.A. Siddiqui of the Epigraphy Branch of the Survey, Nagpur. One hundred and nine inscriptions were copied, examined and reported during the year under review, out of which important ones are noticed here.

A loose fragmentary Arabic record from Ismailpur assigns the erection of a mosque in AH 990 (AD 1582-83), to Qadi Ya' qub. Another damaged inscription in four parts, from the same place, fixed in a local *dargah,* speaks about both the demise of a saintly person Faqir Hashim and the construction of a dome over his remains, in AH 1038 (AD 1628-29).

An Urdu inscription, executed in Nasta' liq characters comes from Jhusi, recounting the fact that a well called Samundra Kup was cleaned and repaired by the zealous efforts of Baba Shiv Darshan Das Gosha' in at the order of the Collector of Allahabad and with the assistance of Munshi Ajodhya Prasad, the TehsildarofPhulpur.inFasli 1285,Samvat 1935 corresponding to AD 1878. The text of this inscription was written by Gokul Prasad Kayast who was the resident of Qasba Narayanpur in *pargana* Kara.

From Kach Daryabad comes a Persian record in Nasta'liq characters. It assigns the construction of the tomb of a pious figure Qutb-i-'Alam, to one Muhammad 'Ali in AH 1116 (AD 1704-05).

4. LODI INSCRIPTION, KARA, DISTRICT ALLAHABAD.— An important but damaged epigraph in Persian, written in Naskh characters, records the construction of the tomb of Khanzad Sidq Khan by Majlis-i-'Ali Jalal Khan, son of'Umar Ahmad, in AH 914 (AD 1508-09), during the reign of Sikandar Shah, (son of) Bahlul.

5. MISCELLANEOUS INSCRIPTION, KARA, DISTRICT ALLAHABAD.—This Persian inscription assigns the construction of a mosque to one Idris by name in AH 1256 (AD 1840-41). Its text was composed by a poet, pen-named Sahar.

6.EPITAPIIS, KOSAM INAM, DISTRICT ALLAHABAD.— Of the two epitaphs, the first one records the death of Sayyid 'Ali in AH 1168 (AD 1755). It was composed by Sayyid Sher Muhammad. The second epitaph, composed by Warith, records the death of Imam 'Ali in AH 1293 (AD 1876-77) who was a Sayyid by lineage and a pilgrim to Karbala.

7. MISCELLANEOUS INSCRIPTION OF MAMLUKS, MEERUT, DISTRICT MEERUT.—A badly damaged Arabic inscription, carved in stucco and photographed from the local *'Idgah',* records the construction of a mosque i.e., *'Idgah'.* Unfortunately, other details pertaining to the builder and the date of construction, are lost. The importance of this epigraph lies in the fact that it offers a fine specimen of calligraphy in Naskh style accompanied with floral designs of the early Mamluk period, i.e., early thirteenth century AD (pl. XXVIII B).

8. MUGHAL INSCRIPTIONS, MEERUT, DISTRICT MEERUT.— This newly discovered but slightly damaged Persian epitaph in Nasta' liq hands, recounts the death of Qari Qadi Ni' matullah, son of Qadi Khan Khatib (i.e., imparter of religious discourse), in AH 941 (AD 1534-35), during the reign of Emperor Humayun.

Another inscription is a seal of a later Mughal, Muhammad Shah Badshah Ghazi, bearing the name 'Abdur Razzaq Khan, obviously the seal-bearer Mughal official, holding some judicial post. The seal bears the date 'first regnal year' of the said king, i.e., AH 1131/AD 1719-20.

9. MISCELLANEOUS INSCRIPTIONS, MEERUT, DISTRICT MEERUT.— A Persian inscription narrates that, following the death of Muhammad Rafiq Qandhari (i.e., of Qandahar in Afghanistan), his tomb was

erected by his close friend Bhim Bihari Lai in AH 1262 (AD 1845-46). Another epigraph, speaking highly of Muhammad Bakhsh, records his sudden death at the age of twenty-nine when he was on his way to Shahpur for *bandobast* (i.e., judicial administration). He breathed his last at the place called Bhira in AH 1272 (AD 1856) and left behind him four young children. In the field of law and justice, he earned great name not only in India but also in England. From the contents of the epigraph, it is quite apparent that the deceased held some important judicial post under the British regime. The third inscription records the death of a saintly person Shaikh Dhuman, son of Shaikh Khuda Bakhsh, in AH 1274 (AD 1858). The last epigraph (installed later on) recounts the death of Hadrat Shah Pir in AH [10]42 (AD 1632-33). It further records that Thomas William Beale, author of the work, *Miftahu't Tawarikh* and author of *Khazinatu'l Asfiya* (Ghulam Sarwar), both have mentioned in their works that Shaikh Mirathi Shattari was a great saint of the Shattari order, residing at Meerut, his birth place, along with many of his spiritual disciples. Mughal Emperor Jahangir had great faith in him and was one of his followers. This inscriptional slab with rare information was set up by Pirji Hasibu'd-Din, son of Muhammad .....Hanafi Zahidi Naqshbandi.

WEST BENGAL

10. MISCELLANEOUS INSCRIPTION, GHATAL, DISTRICT MIDNAPORE.— This metrical record in Urdu assigns the construction of a mosque to a lady named Jumni in the year AH 1278 (AD 1861-62).

11. MISCELLANEOUS EPIGRAPHS, MIDNAPORE, DISTRICT MIDNAPORE.— Among the records from this place, a loose inscription in Arabic in Naskh characters, registers the name Khwaja Shibli, son of Kamardin Nawi and the date AH 1019 (AD 1610-11). This inscription appears to have been fixed in the mosque where it is lying loose now or brought from any other mosque. Two other metrical records in Nasta' liq hands and identical in purport, assign the erection of one and the same beautiful mosque to Abu[1] 1 Farah, a religious scholar, in AH 1269 (AD 1852-53). The last inscription is an epitaph, recording the death of one Anwaru'l Hasan in AH 1285 (AD 1868).

III. NUMISMATICS AND TREASURE TROVE[1]

GUJARAT

1. MISCELLANEOUS GOLD COINS, DISTRICT JAMNAGAR.— A small hoard of twenty-five Turkish coins in thin sheet of gold of Sultan Murad was found from the city of Jamnagar in Saurashtra (pl. XXIX A). Of these, a few appear to be Byzantine coins. On Sultan Murad's coins, the name of Constantinople could be identified as the place from where these coins were minted.

KARNATAKA

2. GOLD COINS, BANGALORE, DISTRICT BANGALORE.— Of the four hundred and fifteen gold coins from Hulimane, received for verification, four hundred and four were identified as *Kantiraya phanams,* four as Tipu *phanams,* five pagodas of Tipu Sultan. In addition to these there were thirteen gold coins issued by Srikrishnadevaraya of Vijayanagara dynasty.

3. HOYSALA COINS, KUDLIGI TALUK, DISTRICT BELLARY.— Eleven ornaments and one Viraraya *phanam* belonging to Hoysala king Ballala III from village Kottur were acquired as treasure trove.

4. SILVER AND GOLD COINS, DISTRICT CHIKAMAGALUR.— Forty-two silver coins of East India Company from Muthodi, Chikkamagalur taluk; sixteen gold coins from Ratnagiri hill, issued by Krishnadevaraya of Vijayanagara dynasty and; twenty small gold *phanams* of Viraraya from Sringeri taluk, issued by the Hoysala king Viraballala III were recieved for verification.

5. SILVER COINS, MALAVANTHIKE, DISTRICT DAKSHINA KANNADA.— Fifty-eight coins belonging to the East India Company were recieved for verification.

6. SILVER COINS, DEVADURGA TALUK, DISTRICT RAICHUR.— One hundred and five silver coins from Neelavangi in Devadurga taluk, belonging to the East India Company were recieved for verification.

7. MISCELLANEOUS COINS, DISTRICT UTTARA KANNADA.— One thousand six hundred twenty-five potin coins belonging to the Satavahana rulers from Agasur, Ankola taluk; eight gold coins of Alupa and Vijayanagara dynasties from Adali; and twenty-one gold coins belonging to Ganga and Hoysala dynasties from Andagi, Sirsi taluk; one thousand one hundred and forty silver coins of East India Company from Balesara, Siddapura taluk; eleven silver coins with Persian legend assignable to Mughal period from Aveda, Joyada taluk; and three hundred and two silver coins of East India Company from Chitragi, Kumta taluk, were recieved for verification.

---

[1]Information from : 1, Department of Archaeology and Museums, Gujarat; 2-7, Directorate of Archaeology and Museums, Kamataka; 10, The State Archaeology, Government of Manipur; and 8-9, Bhopal Circle and 11-12, Calcutta Circle of the Survey.

MADHYA PRADESH

8. COPPER COINS, BERHAT, DISTRICT REWA.—Three square copper coins of second-first century BC were found near the ancient stupa site at Barhat.

9. COPPER COIN, DHAMONI, DISTRICT SAGAR.—One copper coin of medieval period was found inside the fort.

MANIPUR

10. COIN, SALUNGPHAM, DISTRICT THOUBAL.— A bell metal coin depicting Pakhangba in *phithup ahum* posture was recovered.

WEST BENGAL

11. STONE IMAGE OF VISHNU, DISTRICT MALDA.— An image of Vishnu in black basalt was found lying in Bamangola Police Station.

12. STONE IMAGES OF VISHNU, DISTRICT SOUTH DINAJPUR.— Two stone images of Vishnu were found in Hili Police Station and Hili Land Custom Office in South Dinajpur (pl. XXIX B).

IV. OTHER IMPORTANT DISCOVERIES

ANDHRA PRADESH

1. LABEL INSCRIPTION, CHANDRAGIRI, DISTRICT CHITTOOR.—A label inscription in two lines in Tamil characters was noticed on the vertical face of a stone step leading to the doorway *of the mandapa,* while clearing the debris around the Rajarajeswari temple by the Hyderabad Circle of the Survey.

2. EARLY HISTORIC SITE, DISTRICT KRISHNA.— I.K. Sarma alongwith D.R. Gehlot of Hyderabad Circle of the Survey during the course of exploration around the village Kondrapadu in Nandigama taluk, discovered an early historic site yielding black-and-red and red polished wares represented by bowls, dishes, sprinklers, cups, goblets, etc., besides a square plaque of brown slate depicting an early form of Mahishasuramardini datable to Salankayana period (pl. XXX A).

Another important discovery was that of a square *panchayatana* plaque of brown slate with circular slots at the four corners and a bigger one in the centre having carvings of auspicious symbols like *srivatsa, sankha, purna-kumbha* and *mina-yugala* (pl. XXX B).

A *pancha-mukha linga* assignable to early medieval period was also noticed.

3. INSCRIPTION, DHAMMILAPADA, DISTRICT SRIKAKULAM.— The Hyderabad Circle of the Survey reported the discovery of an inscription consisting of twelve lines in twelfth century Telugu characters and language on the inner face of the door jamb of Dhavaleswara Swamy Temple.

GUJARAT

4. MEDIEVAL SITE, DISTRICT KACHCHH.— G.T. Shendey assisted by V.H. Parmar and N.B. Soni of the Excavation Branch V of the Survey discovered a medieval site near village Ganeshpur in Khadir Bet of Bhachau taluk.

5. SCULPTURES, DISTRICT MAHESANA.—The Directorate of Archaeology and Museums, Government of Gujarat reported the discovery of stone sculptures of Vaman (twelfth century AD); Varuna (thirteenth century AD); Kuber (fifth century AD); Matrika (sixth-seventh century AD); Kaumari (seventh-eighth century AD); *Navagraha* panel (Solanki period) from Patan and image of Bodhisattva (third-fourth century AD) from Kheralu.

6. SCULPTURES FROM SHAMLAJI, DISTRICT SABARKANTHA.— The Directorate of Archaeology and Museums, Government of Gujarat discovered an image of Ganesa assignable to eight-ninth century AD and a Siva-//«ga of pre-Solanki period.

HARYANA

8. MUGHAL BRIDGE, DISTRICT AMBALA.— P.K. Mishra of Chandigarh Circle of the Survey noticed Mughal Bridge at Air Force base area near Ambala. The bridge oriented east-west, made of *lakhauri*

bricks contains five spans, the arches of which are broken. The parapet walls and the surface wall on the top are laid with brick-on-edge.

JAMMU AND KASHMIR

9. PALAEOLITHIC TOOLS, DISTRICT LEH.— R.S. Fonia, assisted by Puran Singh, Balbir Singh Jamwal and Tsering Wangchuk of Srinagar Circle of the Survey discovered palaeolithic tools from the Tirisa lake and Hundar Dok Nalla in the Nubra Valley. The stone tools found in Tirisa lake comprise (unifacial) chopper flake and scrapers made out of quartzite, granite and diorite.

Palaeolithic tools found in Hundar Dok Nalla are in addition to the rock-shelters, caves and shrines from Hunder Dok Nalla site, a major halting place on Phyang and Hundar Dok route. The traces of murals, hearth and fire places are suggestive of the fact that the route was frequently used by nomads and Buddhist monks who followed each other into Central Asia.

KARNATAKA

10. PALAEOLITHS AND MEDIEVAL MOUNDS, HOOLI, DISTRICT BELGAON.— Explorations along the feeder stream near Hooli by M.V. Visvesvara and T.M. Keshava of the Bangalore Circle of he Survey brought to light artefact of lower and middle palaeolithic tools. The tools comprise of handaxes and cleavers made on sandstone and quartzite besides a lone fragment of chert blade. Occurrence of discoids, probably used as scraper, flaked all round and resembling Mousterian cores is a noteworthy feature. Disturbed mounds of early medieval times, inscribed slabs and sculptures assignable from ninth to twelfth century AD were reported from Hooli. An inscribed *makara-torana* bearing a unique depiction of Vishnu as Vaikuntha *(chaturatman)* in the Andhasura temple at Hooli was also discovered (pl. XXXI B).

11. PALAEOLITHIC TOOLS, DISTRICT BIJAPUR.— M.V. Visvesvara and T.M. Keshava of Bangalore Circle of the Survey on a sporadic exploration on the right bank of Malaprabha river discovered lower and middle palaeolithic implements near Katapur (2 km east of Pattadakal) in Hungund taluk (pl. XXXI A). The artefacts comprise handaxes, cleavers, discoids made of fine grained quartzite. Tools fashioned on thick flakes were also collected.

12. LABEL INSCRIPTION, SANNATHI, DISTRICT GULBARGA.— A label inscription in second century Brahmi characters was noticed by the Hyderabad Circle of the Survey, on a broken limestone slab depicting the procession of elephants and a horse led by a *chauri*-bearer.

13. HERO-STONES AND INSCRIPTIONS, KUMTA, DISTRICT UTTARA KANNADA.— K.G. Bhatsoori of the Directorate of Archaeology and Museums, Government of Karnataka noticed inscribed hero-stones assignable to twelfth-thirteenth century at Algar, Hosad and Santagal. He also found four inscriptions in Kannada characters in the premises of Mahabaleswara temple at Hiregutti, High School at Katagal, temple at Mirjan and Ganapathi temple at Ullurmutt. These inscriptions are assignable between eleventh and sixteenth-eighteenth century AD.

KERALA

14. MENHIRS, DISTRICT KOLLAM.— T. Satyamurthy assisted by P. Sreedharan of the Directorate of Archaeology, Government of Kerala, in the course of exploration, located seven menhirs and a capstone of granite.

15. TEMPLE AND MEGALITH, DISTRICT KOTTA YAM.—P. Sreedharan of the Directorate of Archaeology, Government of Kerala reported the discovery of a Rock-cut temple at Moozhiyurkara in a disturbed condition. He also noticed menhir in granite at Arpukkara.

16. MEGALITHS, MUDIMALA, DISTRICT PATHANAMTHITTA.— P. Rajendran of the University of Kerala reported the laterite chambers at Mudimala in Kadamankulam near Kalluppara in Pathanamthitta. The laterite pits peculiar to the high lateritic terrain in the south-west coast of India were reported earlier from Kerala as well as coastal Karnataka.

The chambers at Mudimala measures 1 -5 x 1 -0 m with a depth of 1 -5 m were cut steeply in hard laterite and revealed iron implements.

Of the three chambers found adjacent to each other, one chamber has a round port-hole on one side which opens to the next one. The port-hole was closed with a rock-slab. The chambers are also closed from above with the rock-slabs and laterite projections are seen on one side. There were only three small rock-slabs in the opened chamber and it was filled with gravelly soil.

17. ROCK-CUT CAVE, MUDIMALA (THIRUVALLA), DISTRICT PATHANAMTHITTA.—P. Sreedharan and D.Mohanan Nair of the Directorate of Archaeology, Government of Kerala noticed Rock-cut cave at Mudimala.

18. URN -BURIAL SITE, KARIMBALOOR, DISTRICT PATHANAMTHITTA.—P. Sreedharan of the Directorate of Archaeology, Government of Kerala, discovered urn-burial site at Karimbaloor.

19. MENHIR, KAKKOTTUMULA, DISTRICT QUILON.— P. Rajendran of the University of Kerala discovered a menhir site located one km south of the Mayyanad railway station on its right side in the lowlands. This laterite monolith facing north-east (90 X 60 cm) has a curved top with sides sloping vertically down. Mangad menhir site is also at about the same distance from Mayyanad and similar types are reported from various parts of district Quilon.

20. STONE SCULPTURE, DISTRICT THIRUVANANTHAPURAM.— P. Sreedharan of the Directorate of Archaeology, Government of Kerala, reported the discovery of stone image of Naga.

21. ROCK-CUT CAVES, KALLUMPURAM (KUNNAMKULAM), DISTRICT TRISSUR.— P. Sreedharan and P. Mohanan Nair of the Directorate of Archaeology, Government of Kerala during the course of exploration discovered two Rock-cut caves, different types of pottery and iron implements.

MADHYA PRADESH

22. MEDIEVAL SITES, DISTRICT BHOPAL.— G.T. Shende of the Excavation Branch V of the Survey assisted by K.R. Malviya discovered two sites near village Lalariya. These sites are locally known as Khejara Kamal and Chandan Kheri and belong to the medieval period.

23. ANCIENT REMAINS, BAGH, DISTRICT DHAR.—H. Michael of Bhopal Circle of the Survey noticed a historical site near Bagh and collected pottery and other antiquities belonging to the Kshatrapa and the Gupta period.

24. PARAMARA SCULPTURE, MANDU, DISTRICT DHAR.— A.K. Soni of Bhopal Circle of the Survey

collected a beautiful image of *chauri*-bearer of the Paramara period which is now preserved in the Taveli Mahal.

25. BRICK STUPA, SATDHARA, DISTRICT RAISEN.— R.C. Agrawal of Bhopal Circle of the Survey noticed remains of brick stupa inside the damaged drum of stupa 1 above the *medhi.* The brick stupa is in a very dilapidated condition and appears to be of Mauryan period.

26. ENGRAVING, SANCHI, DISTRICT RAISEN.— D. Dayalan and Narayan Vyas of Bhopal Circle of the Survey discovered a stone slab bearing an engraving of an inverted lotus, probably belonging to the Sunga period.

27. FRAGMENTS OF VEDIKA PILLARS, HARMIKA ETC., SATDHARA, DISTRICT RAISEN.— After removal of debris from stupa 1 at Satdhara a good number of fragments of *vedika* pillar, *harmika, chhatra, suchi, ushnisha,* etc., were found by the Bhopal Circle of the Survey. The pieces of railing depicting lotus medallion, animal figure, trees and other symbols (pl. XXXII), were also recovered during the operation.

28. PAINTED INSCRIPTION, SATDHARA, DISTRICT RAISEN.— Narayan Vyas of Bhopal Circle of the Survey noticed painted inscriptions in Gupta characters in a rock-shelter near the Buddhist monuments (pl. XXXIII A).

29. STUPA, STRUCTURES, TEMPLE REMAINS, SATDHARA, DISTRICT RAISEN.— R.C. Agrawal of Bhopal Circle of the Survey noticed several stupa remains, stone structures, monastery, apsidal temple plan, etc., in the vicinity of great stupa at Satdhara.

30. VOTIVE STUPA, SANCHI, DISTRICT RAISEN.— Under the supervision of R.C. Agrawal of Bhopal Circle of the Survey three miniature votive stupas were exposed over a stone flooring.

31. ANCIENT REMAINS AND POTTERY, BERHAT, DISTRICT REWA.— S .K. Verma of Bhopal Circle of the Survey during the course of conservation of stone stupa discovered a stone slab engraved with mother goddess along with blades, iron objects, etc., from the debris. Few pieces of NBP and other pottery type were also found (pl. XXXIV).

32. PAINTED ROCK-SHELTERS, GUDH, DISTRICT REWA.— D. Dayalan and Narayan Vyas of Bhopal Circle of the Survey noticed painted rock-shelters depicting scene of animal figures, etc., in red colour in the vicinity of village. From the rock-shelters, microliths, flakes, cores made on quartz, chert and chalcedony were collected.

33. QUATERNARY DEPOSITS IN SON VALLEY, DISTRICT SIDHI.—The Geological Survey of India (GSI) Central region, Nagpur noticed the quaternary alluvial sediments preserved along the Son Valley in the area between Churhat (24° 25'; 81° 40') and Baghor(24°33'; 82° 19') in district Sidhi. Baghor formation of these deposits contains lower and middle palaeolithic handaxes and scrapers curved on Bijawar quartzites. These are found associated with fossil mammals of upper Pleistocene age. Younger horizons have yielded middle palaeolithic flakes of chert and chalcedony.

34. ENGRAVINGS, VIDISHA, DISTRICT VIDISHA.— Narayan Vyas of Bhopal Circle of the Survey noticed an engraved elevation of a temple plinth moulding at Bijamandal.

35. PARAMARA SCULPTURES, VIDISHA, DISTRICT VIDISHA.— R.S. Shrivastava of Bhopal Circle of the Survey during the course of conservation work collected Paramara sculptures and architectural fragments near Bijamandal.

36. VISHNU IMAGE, UDAYGIRI, DISTRICT VIDISHA.—R.S. Shrivastava of Bhopal Circle of the Survey collected near Udaygiri caves a miniature plaque of Vishnu assignable to third-fourth century AD (pl. XXXIII B)

MAHARASHTRA

37. QUATERNARY DEPOSITS, GODAVARI VALLEY, DISTRICT NASIK.—Patchy occurrences of Quaternary deposits were traced along the valleys of Godavari and its tributaries in the area between Nanded (19° 04"; 77° 19') and Nasik (20°00'; 73°47') by the Scientists of the GSI, Central Region, Nagpur. Lower palaeolithic implements are rare in these deposits and a number of handaxes of basalt have been reported from Nevasa (18°32"; 75°55'). However, middle palaeolithic flakes of chert and chalcedony were found in plenty in the area near Nevasa (18°32'; 75°55'), Kopargaon (19°52"; 74°30'), Sangamner (19°34'; 74° 12'), etc.

MANIPUR

38. ARCHAEOLOGICAL REMAINS AND POTTERY, MOIRANG, DISTRICT BISHNUPUR.— The State Archaeology, Government of Manipur discovered a wooden coffin alongwith funerary goods. The coffin was found buried in the northeastern corner of a pond. The coffin looks like a dug out canoe and is about 14 feet long and one and a half feet wide. The body of the deceased was probably placed in extended position with the head towards north and the funerary goods were placed along the lateral sides of the coffin. The goods consisted of four red pots, three daos, two knives, a wooden spear, beads of precious stone and glass, coiled ear-ring made of brass or bronze and a number of human teeth. The most important find is the pot painted with geometric design around its shoulder in black. On the basis of earlier evidence and also from C-14 method these could be assignable to AD 1170.

39. ARCHAEOLOGICAL REMAINS, MOIRANG PUREL, DISTRICT IMPHAL.— The State Archaeology, Government of Manipur recovered bronze ring sockets and cowrie shells.

40. WOODEN CANOE, IMPHAL COLLEGE, DISTRICT IMPHAL.— The State Archaeology, Government of Manipur reported the discovery of a wooden conoe from the Imphal College compound while digging a pond.

41. MEGALITHIC REMAINS, WILLONG, DISTRICT SENAPATI.— Sapam Bheigya Singh, S. Rupoban Singh of the State Archaeology, Government of Manipur, discovered extensive megalithic monuments near the old gate of Willong village during the course of exploration. The huge monoliths locally known as *Sakchee saha* were generally erected in the month of *Tinguika* (March) by the wealthy people of the village to attain status in their community. The huge stones were brought from the place known as *Magaidu,* which is located on the higher slope about 2 km away from Willong village.

TAMIL NADU

42. CAIRN CIRCLES AND POTTERY, DISTRICT CHENGALPATTU-M.G.R.—In an area between Chittalambakkam and Chinna Elamchery situated about 15 km from Kanchipuram, thirteen cairn

circles were noticed along with sherds of black-and-red by the Department of Ancient History and Archaeology, University of Madras. At Kovalam a number of porcelain sherds belonging to the eleventh-seventeenth century AD were noticed.

43. UNIQUE STRUCTURE, SHORE TEMPLE COMPLEX, MAHABALIPURAM, DISTRICT CHENGALPATTU-M.G.R.—In continuation of the discovery of a flight of steps leading to the *mahadvara,* while exposing and conserving the structural remains in the complex *(1990-91,* p. 140), further clearance of sand-drift carried out on the southern side of the steps by the Madras Circle of the Survey, resulted in the discovery of an ancient, unique and massive *bathing-ghat* like structure running north to south almost parallel to the sea line. The structure which has been exposed to a length of nearly 50 m rises to a height of 3.60 m and is provided with five landings of 0.50 m width at regular intervals. The structure is built of large laterite blocks used for core and granite slabs for veneering.

However, the most significant aspect adopted in the construction is the method of locking the veneering slabs from internal collapse. A 0.30 m wide slab with rounded top-edge and grooves just below the rounded top, firmly embedded in the laterite core, is placed at almost middle of vertical joints of two slabs fitting into the grooves. In addition, another smaller slab with groove is projected from the core to hold the slabs at the horizontal joint of the slabs. Thus, the veneering slabs are well secured from internal collapse. Interestingly, this archaic method of locking of veneering slabs brings to memory the technique adopted for the purpose by the chamber builders in the megalithic period.

This *bathing-ghat-* like structure possibly runs further south to a length of 150 to 200 m. However, definite purpose served by this structure and the period of construction can be ascertained only after exposing completely.

44. SHERDS OF ROULETTED WARE AND CHINESE POTTERY, DISTRICT MADRAS.— While examining the foundation pits dug out at various construction sites in Santhome (in Mylapore) a number of Rouletted sherds and Chinese sherds were collected by the Department of Ancient History and Archaeology, University of Madras.

45. ANCIENT MOUND, DISTRICT NORTH ARCOT-AMBEDKAR.— The Department of Ancient History and Archaeology, University of Madras collected the sherds of black-and-red ware, black-ware and red-slipped ware, semiprecious stone beads and terracotta spindle whorls and hopscotches from an extensive mound (5 acres) at Puttutakku.

UTTAR PRADESH

46. TEMPLE REMAINS, SAHORI, DISTRICT ETAH.— G.N. Srivastava of Agra Circle of the Survey noticed the temple remains at village Sahori of Patiali tehsil in district Etah. While digging at the mound, villagers located some structural remains and subsequently unearthed remains of a temple. These remains consist of various architectural members fashioned out of *kankar-* slab (lime conglomerate) carved with the motifs and sculptural panels typical of the Pratihara period. From the available remains it appears that it was a small shrine of about 3 m height. A paved courtyard of the well-dressed *kankar-*slabs also found around the temple.

WEST BENGAL

47. LATE HISTORICAL SITE, NUNI, DISTRICT BARDHAMAN.— S. Maiti of Calcutta Circle of the Survey discovered a late historic stone structure and a stone sculpture of warrior from a low mound at village Nuni.

48. STONE TEMPLE, KHUDKA, DISTRICT BARDHAMAN.— A stone temple in Orissan *Rekha* order belonging to tenth-eleventh century AD was found at Khudka by S. Maiti of Calcutta Circle of the Survey.

V. RADIOCARBON DATES

Radiocarbon dates[1] presented in the following pages were determined at the Physical Research Laboratory, Ahmedabad. The dates[2] are in BP and are based on half-life value of 5730±40 years; and for their conversion into BC/AD scale, the year 1950 is to be taken as the base. The dates are uncorrected for $^{14}C/^{12}C$ variation. For calibration procedures, *see Radiocarbon,* Vol. 28, No. 2 B, 1986 and Vol. 35 No. 1,1993. A set of available calibrated archaeological ^{14}C dates has been supplied to the Libraries of the Survey, Indian Council of Historical Research, New Delhi and Deccan College, Postgraduate and Research Institute, Pune.

ASSAM

1. KANAI GOAN RESERVE, DISTRICT DIBRUGARH
   PRL-1234. Neolithic Culture — 1440 ± 80
   Reddish Soil, depth 0-9 m.
   Sender's Sample No. 2

BAY OF BENGAL

2. BAY OF BENGAL
   (i) PRL-1686. Marine sediment
   Shells from sediment core — 1480 ± 120
   Depth 0-5 cm.
   Core No. SK-31/11. (ii)
   PRL-1689. Marine sediment
   Shels from sediment core — 14390 ± 340
   Depth 95-100 cm.
   Core No. SK-31/11

---

[1]Contributed by Sheela Kusumgar and M.G. Yadava of the Physical Research Laboratory, Navrangpura, Ahmedabad 380009. Further details can be obtained from Excavators.

[2]Samples submitted by : 1, Department of Anthropology, Dibrugarh University, Assam; 2-7, National Institute of Oceanography, Goa; 8-9, University Museum, 33rd and Spruce Streets, Philadelphia, USA; 10-11, Physical Research Laboratory, Ahmedabad; 12, Directorate of Archaeology and Museums, Mysore; 13-15, Deccan College, Postgraduate and Research Institute, Pune; 16, Excavations Branch of the Survey, Nagpur; 17, Construction Department, Godrej and Boyce Mfg. Co. Ltd., Bombay; 18, Italian Embassy Cultural Centre, New Delhi; 19, Hindustan Zinc Ltd., Rajpura Dariba Mines, Udaipur; 20-13, Regional Geology Division-II, Geological Survey of India, Aliganj, Lucknow.

CENTRAL WEST COAST OF INDIA

3. ANJUNA

PRL-1563. Quaternary Beach rock sample Sender's Sample No. BR-7 — 1920 ±130

4. BHANDARPULE

PRL-1561. Quaternary Beach rock sample Sender's Sample No. BR-5 — 2790 ±140

5. MIRYA

PRL-1560. Quaternary Beach rock sample Sender's Sample No. BR-4 — 1410 ±120

6. VELNESHWAR

PRL-1558. Quaternary Beach rock sample Sender's Sample No. BR-2 — 3130 ±190

7. KALBADEVI

PRL-1559. Quaternary Beach rock sample Sender's Sample No. BR-3 — 1100± 110

GUJARAT

8. ROJDI, DISTRICT RAJKOT

PRL-1704. Harappa Culture Charcoal from Trench 46 p Layer Stratum (3), Depth 0-75 m. Sender's Sample No. Lot 23135 — 5880 ± 60

9. BABARKOT, DISTRICT BHAVANAGAR

PRL-1486. Sorath Harappan Charcoal from Trench 26 L, Layer 4, Depth 1 m Sender's Sample No. 167 — 2370 ±130

10. NALSAROVAR, DISTRICT AHMEDABAD

PRL-1635. Quaternary Organic mud from Nalsarovar lake Depth 2-93 m Sender's Sample No. N-85	7380 ± 130

JAMMU AND KASHMIR

11. MANSAR, DISTRICT JAMMU

(i)	PRL-1631. Quaternary Organic part of lacustrine Sediment core, Depth 1-34 to 1-50 m. Sender's Sample No. MS6 (134/150).	2520 ± 120
(ii)	PRL-1634. Quarternary Organic part of lacustrine Sediment core, Depth 0-93 to 1-03 m. Sender's Sample No. MS5 (93/103).	1420 ±140

KARNATAKA

12. BUDIHAL, DISTRICT GULBARGA

(i)	PRL-1530. Neolithic Charcoal from dugout habitation area east of ashmound, Layer 2, Locus Ashmound-I, Depth 0-5 m. Sender's Sample No. 1	22501140
(ii)	PRL-1531. Neolithic Charcoal from Trench E-2 Layer 2, Locus ashmound-I Depth 0-6 m. Sender's Sample No. 2	4610 ±140

13. WATGAL, DISTRICT RAICHUR

(i)	PRL-1581. Neolithic Charcoal from Trench A3, Depth 3-8 to 4-0 m below datum Sender's Sample No. Lot 015	3990 ±40
(ii)	PRL-1584. Neolithic Charcoal from Trench A4, Depth 3-8 to 40 m. below datum Sender's Sample No. Lot A4, 012	3910 ±60

(iii) PRL-1589. Neolithic — 4150 ± 50
Charcoal from Trench A6, Depth
4-2 to 4-4 m below datum,
Sender's Sample No. Lot A4, 009

KERALA

14. VELLOOR, DISTRICT TRICHUR

(i) PRL-1632. Quaternary — 5220 ±160
Carbonised wood from palaeochannel deposit,
Depth 2-50 m. Sender's Sample No. VLR (1)

(ii) PRL-1633. Quaternary — 3390 ±110
Carbonised wood from palaeochannel
deposit, Depth 2-50 m. Sender's
Sample No. VLR (2)

MADHYA PRADESH

15. CHAHIN NALA, DISTRICT EAST NIMAR

PRL-1542. Quaternary — 490 ± 80
Charcoal and wood fragments from Trench-II,
Depth 0-2 m.
Sender's Sample No. P 11-31

MAHARASHTRA

16. ADAM, DISTRICT NAGPUR

PRL-1368. Chalcolithic culture — 3460 ± 90
Charcoal from Trench S5, Locus Qd.l
Layer 16, Depth 6-8 m.
Sender's Sample No. ADM-CS-010

17. THANE CREEK, DISTRICT BOMBAY SUBURBAN (E)

PRL-1654. Quaternary — Modem
Creek from Thane, Depth 0.05 m.
Sender's Sample No. ILL

18. RAUAL-HARD, EASTERN OMAN

PRL-1658. Harappan, Period I — 4430 ±60
Mussels from South of Raijal-Hard
Eastern Oman
Sender's Sample No. RJ-2

RAJASTHAN

19. RAJPURA DARIBA MINES, DISTRICT UDAIPUR

(i)	PRL-1253. Ancient Mining Wood from east lode archaeological excavations Depth 20 m. Sender's Sample No. 3 and 4	2870190
(ii)	PRL-1254. Ancient Mining Wood from east lode archaeological excavations, Depth 20 m. Sender's Sample No. 1 and 2	2730 ±90

UTTAR PRADESH

20. UJRAUTI, DISTRICT BASTI

(i)	PRL-1516. Quaternary Carbonate portion of Kanker from seasonal Nala, Depth 0-1 m. Sender's Sample No. 27/SP/GKP	6850 ± 90

21. ZAMANIA GHAT, DISTRICT GHAZIAPUR

PRL-1517. Quaternary Carbonate portion of Kanker from seasonal Nala, Depth 10 m. Sender's Sample No. 1/SP/Zam	12640 ± 150

22. KIRAKAT, DISTRICT JAUNPUR

PRL-1519. Quaternary Carbonate portion of Kanker from seasonal Nala, Depth 10 m Sender's Sample No.K-1-AUK	6200±110

23. SUKHDEVGHAT, DISTRICT MUZZAFARNAGAR

PRL-1515. Quaternary Carbonate portion of Kanker from seasonal Nala, Depth 15 m. Sender's Sample No. GK/QG/1/90	7480 ± 160

VI. PALAEOBOTANICAL AND POLLEN ANALYTICAL INVESTIGATIONS[1]

The present report incorporates the work done on the subject at Birbal Sahni Institute of Palaeobotany, Lucknow.

BIHAR

1. MANJHI (25° 50'; 84" 34'), DISTRICT S ARAN.—The remains of carbonised grains and seeds from following cultures characterized by a red ware industry, datable from 250 BC to AD 250 were examined. The food grains include bread-wheat *(Triticum aestivum),* dwarf- wheat *(Triticum sphaerococcum),* barley *(Hordeum vulgare),* rice *(Oryza sativa),* field-pea *(Pisum arvense),* black-gram *(Vigna mungo),* lentil *(Lens culinaris),* ragi-millet *(Eleusine coracana)* and grass-pea/Khesari *(Lathyrus sativus).* A seed of grape *(Vitis vinifera)* was an important find. In all likelihood the *raisins/draksha* would have been an item of import from some contemporaneous cultural communities in northwestern direction.

PUNJAB

2. SANGHOL (30° 47"; 76° 23"), DISTRICT LUDHIANA.— The plant remains recovered from Baran/ Late Harappan culture *(circa* 1900-1400 BC) include cereals, pulses and oilseeds belonging to barley *(Hordeum vulgare),* wheat *(Triticum sphaerococcum* and *T. aestivum), jowar-* millet *(Sorghum bicolor),* Italian-millet *(Setaria italica),* lentil *(Lens culinaris), grasspea/Khesari (Lathyrus sativus),* fieldpea *(Pisum arvense), sesame/til (Sesamum indicum)* and *linseed/alsi (Linum usitatissimum).* Leguminous forage crops of horsegram *(Dolichos biflorus)* and Egyptianclover *(Trigonella alexandrinum)* were also recorded by their seeds: the latter, which is an important forage crop in Punjab, Kangra region of Himachal Pradesh and Uttar Pradesh, was appeared for the first time in the archaeological records of the subcontinent.

Cotyledons of hyacinth-bean/sem-bean *(Dolichos purpureus)* seeds furnish evidence of the cultivation of this leguminous climber for vegetable. Seeds of lemon *(Citrus limon)* and Karaunda *(Carissa carandas)* from Sanghol, reported for the first time in the Indian subcontinent, suggest the cultivation of these fruit shrubs.

Seeds of poppy *(Papaver* sp.) found compressed in a small piece of some cake-like structure, are different from those of modern *Papaver somniferum* (opium-poppy), which does not occur in the wild anywhere. It was not possible from the botanical standpoint, to distinguish precisely the variety of ancient poppy seeds from Sanghol, due to perplexing diversity and relatively high degree of

---

[1]Contributed by K.S. Saraswat and Chanchala Srivastava of the Birbal Sahni Institute of Palaeobotany, 53, University Road, Lucknow-226 007.

confusing intraspecific variations in the seed size and ornamental pattern. There are records that some wild or halfway between the wild and cultivated forms of poppy were cultivated in pre-historic Europe. A good deal of information is available on the use of opium poppy in the ancient Sumerian, Babylonian and Assyrian civilizations of Mesopotamia. Whatsoever the form of poppy was in use at Sanghol, the seeds compressed in a cake-like form indicate that either they were palatable to eat or to extract oil. In view of this we can go some way in order of likelihood, that during the Harappan times the poppy was used as a food source and for its medicinal value. The acquaintance of psychoactive drug of opium for use in medicine, religious ritual and recreation may also not be ruled out. This is the sole record of the use of poppy in the archaeological context of the subcontinent, to be reckoned with.

The remains of weeds and other wild taxa represented by seeds, include *Vicia sativa, Indigofera* sp.. *Indigofera astragalina, Fumaria* sp., *Phalaris minor, Cenchrus* sp., *Chenopodium album, Desmodium* sp. and *Capparis aphylla.*

Mixed in the wood charcoal pieces of *Acacia* sp., *Ziziphus* sp., *Tamarix* cf. *articulata, Albizia lebbeck, Ficus glomerata* and *Ephedra* sp., a charcoal fragment of some species of Jasmine (Jasminum) is most important, which signifies the cultivation of ornamental plants by Barans/ Harappans, for their fragrant flowers.

VII. MUSEUMS

1. TAJ MUSEUM, AGRA.— Replacement of worn-out background cloth of showcases with new ones was completed.

2. ARCHAEOLOGICAL MUSEUM, AIHOLE.—During the year under review new pedestals for display of important objects were prepared for display of Buddha and *Sapta-matrika* panels were provided with masonry pedestals. Historical boards, labels and map showing different site museums were fixed.

3. GOVERNMENT MUSEUM, AJMER.—During the year under review, three new wall showcases were prepared for display of copper-plates and Jaina sculptures. Fifty wooden pedestals alongwith fixing of aluminium sheets at the bottom of the pedestals of the sculptural gallery were provided with oil colour paint. All the galleries were provided with sufficient tube-lights. Wooden frames to ten inscriptions were provided. A book on the *Glory of the Chauhans of Ajmer* was published.

4. ALLAHABAD MUSEUM, ALLAHABAD.— The museum collection was further enriched by the acquisition through purchases of three gold and one silver coins, two copper-plates, eleven modern paintings and thirty-six documents and manuscripts. These include three Roman gold coins of King Caesar; one silver coin of Nahpana overstruck by Gautamiputra Satakarni; two miniature tempera paintings done on the roof of India House, London by Ranada Ukil; and five tempera paintings of Sudhir Ranjan Khastgir.

Two stone sculpture galleries were reorganized. Six hundred twenty-three books were added to the Library.

Museum also organized two seminars on *"The Relevance of Indian Art Tradition"* on 25-26 February 1993 and Art and *Culture of Madhyadesha* - AD 300-1000 on 22-24 March 1993.

Special exhibitions on *Masterpieces of Indian Art* (August-September 1992) and *d' Peaks of Illumination* (March-July 1993) were also organized. Two exhibitions based on the works of young artists of Allahabad - one in February 1993 and the other in March 1993 were also arranged.

Under Museum's Educational programmes the Museum also arranged illustrated lectures by eminent scholars like Professors T.V. Pathy, K.K. Thaplyal and G.C. Pande and Ananta Giri alongwith two short-term courses on 'Art Appreciation Course' (June 1992) and 'Orientation Programme on Art and Archaeology' (August 1992).

In order to commemorate the 'World Heritage Week' (18-25 November 1992) and Birth Anniversary of A.K. Coomaraswamy (22nd August 1992), various programmes were organized.

The research papers presented in the seminar on 'Tolstoy and Gandhi' were published.

Museum Conservation Laboratory treated and conserved five hundred sixty-four objects. Six hundred fifteen objects were photo documented and twenty new rubber moulds and three hundred plaster and eight fibre-glass replicas were prepared during the year under review.

5. STATE MUSEUM, ALMORA.— During the period under review two hundred fifty-seven objects were acquired. Important among these are gold coin (diameter 2 cm) assignable to eighteenth century from Kapina; copper harpoon (20.5 X 2.00 cm) from Badayun, Uttar Pradesh; and broken stone image of *chauri*-bearer (18 X 13 cm), assignable to medieval period from Almora.

6. ARCHAEOLOGICAL MUSEUM, AMARAVATI.—The Museum collection was enriched by acquisition of stone slabs from Amareswara temple complex. Among these, a fragmentary inscribed slab datable to third-fourth century AD recording the creation of a memorial pillar by the wife of a minister is worth mentioning.

7. ARCHAEOLOGICAL MUSEUM, BADAMI.— An image of Chamunda was acquired and displayed alongwith other sculptures on masonry pedestals at the left side of the gate leading to the fortifications. Pedestals were prepared for display of important objects.

A masonry water tank was constructed. Labels for all the exhibits and a pictorical map showing different site museums were prepared and fixed.

8. ARCHAEOLOGICAL MUSEUM, BIJAPUR.—During the year under review one stone image of female figure was acquired. Four earthen jars were also displayed on wooden pedestals.

9. ARCHAEOLOGICAL MUSEUM, BODHGAYA.— Data-sheets of the museum objects were prepared. Life-size Buddha image was installed in the lawn of the museum. The main hall was provided with track-light.

10. INDIAN MUSEUM, CALCUTTA.— Museum collection was further enriched with the addition of two images through long term loan from the Survey. Of the two images, one is of Vishnu in black basalt flanked by Lakshmi and Saraswati and other of Nataraja in bronze.

11. MATTANCHERRY PALACE MUSEUM, COCHIN.— Reorganization of displayed royal robes and multi-twisted three royal garlands was completed. The royal carpet was displayed in a slanting glass showcase. The stamps relating to the rulers of Cochin were displayed in a slanting wooden showcase alongwith tri-lingual labels.

All the museum objects were photo-documented. The palanquin displayed in Gallery 6 was shifted to Gallery 2.

A board directing visitors comprising brief note on the objects were provided.

12. CHANDRADHARI MUSEUM, DARBHANGA.— During the year under review the Raj Nagar Metal Gallery was reorganized by displaying some of the beautiful sculptures from the reserve collection.

13. ARCHAEOLOGICAL MUSEUM, GWALIOR.— Twenty-six masonry pedestals were prepared for display of objects. Sculptures and pillars were displayed in the open lawns in front of hospital and Jaina building.

The ceilings, walls and pedestals of the gallery as well as the exterior walls of the Hospital building were painted and colour-washed.

The broken glasses of the arches of western verandah of the Jail Building and arches and window of the western verandah of the main hall and adjoining halls of building were also replaced. The damaged pedestals in the main hall, adjoining hall, western as well as eastern verandah were also restored.

A general sign board of the museum with brass letters was provided.

14. ASSAM STATE MUSEUM, GUWAHATI.— A new gallery on village life of Assam was organized and opened for public view. The objects displayed include household items; models of houses and craft items; musical, agricultural, fishing instruments and food grains alongwith models of traditional Assamese recipes.

Museum also acquired a good number of coins belonging to medieval and modern periods.

15. ARCHAEOLOGICAL MUSEUM, HALEBID.— Masonry pedestals were prepared for objects to be exhibited in the open air. Alteration of the pillar showcases and shifting of sculptures from western to the eastern wings of the museum were completed.

16. ARCHAEOLOGICAL MUSEUM, HAMPI.— An exhibition showing different views of the excava tions and conservation works undertaken at Hampi was organized and opened to the public view on the occasion of the World Heritage Day.

The faulty electrical outfit in the gallaries were restored.

17. SALARJUNG MUSEUM, HYDERABAD.— The Museum organized five temporary exhibitions on *'Customs and Textiles of Hyderabad'; Manuscripts of Hyderabad; Recent Acquisitions of Salarjung Museum; Contemporary Art of India;* and *Deccani Rare Manuscripts.* Under academic programmes, five illustrated lectures on *Challenges to Indian Nationalism* by MJ. Akbar, *On Amir Khushroo* by Rajendra Prasad; *Qutub Shahi Architecture* by V.V. Krishna Sastry; *Indian Heritage in Science and Technology* by B.G. Siddhartha; and *'Communication and National Integration* by S. Basheeruddin were also arranged.

A mobile exhibition on *Monuments of Hyderabad* was also organized.

In order to perpetuate the memory of the founder of the museum, Salar Jung III, the museum celebrated birth day and arranged Salarjung Memorial Lecture also.

To celebrate children's week (14 November), museum arranged essay writing and elocution contests for both college and High School students. Rangoli competition was also conducted on 13 January.

Besides, a Qaumi Ekta Week was also observed in museum by conducting elocution contest by the school and college students.

18. ARCHAEOLOGICAL MUSEUM, KHAJURAHO.— All the damaged pedestals and showcases in the gallery were restored and reveneered.

Display of objects with proper arrangements in the Jardine Museum was completed.

19. FORT ST. GEORGE MUSEUM, MADRAS.— The damaged hard boards were restored and reveneering done in the Gallery 5, 6 and 8.

The album pertaining to the photographs of antiquities and Data-sheets of the museum objects was completed.

Wooden uniforms exhibited in the showcase 5, 6, 7 and 8 of Gallery 2 were adorned with new cloth. The old background cloth of table showcases of Gallery 9 was replaced with new one.

20. GOVERNMENT MUSEUM, EGMORE, MADRAS.— The museum collection was further enriched by the addition of twenty objects as treasure trove. Besides, an Exhibition on South Indian Bronzes was also inaugurated by the Chief Minister of Tamil Nadu on 14 April, 1992.

21. GOVERNMENT MUSEUM, MATHURA.— The museum collection was further enriched by the acquisition of seven stone sculptures, one terracotta, one gold coin, fourteen silver coins, one hundred ninety-three copper implements, two paintings, three textiles, ten bronzes and thirteen other objects.

Twenty-four stone sculptures and terracotta objects were sent to Berlin for display during Festival of India from March to June 1992.

Surya in niche from Madaur, Sadabad, Mathura was also sent to Asia Society Gallery, New York for exhibition on *"Gods. Guardians and Lovers - Temple Sculptures from North India"* held in April, 1993.

An Inter-State Exhibition on *'Braj Art and Culture'* from 24 April 1992 was arranged in the National Museum, New Delhi jointly with National Museum and Braj Seva Sansthan, Mathura.

22. PRINCE OF WALES MUSEUM, MUMBAI.— The museum acquired one hundred and seven objects. Two hundred eleven new books and ninty-one periodicals were also added to the research Library.

Under Coomaraswamy Memorial Lecture Series, R.S. Bisht delivered lecture on *Dholavira and Banawali-Indus sites* on 13-14 September 1993.

As a part of Museum's outreach programme, craft activities such as clay modelling, block-painting, landscape painting were conducted at Colaba Municipal School. Art and craft classes were also arranged at Virawali Municipal School, Andheri.

During the period under review the museum was visited by His Excellency Ruslan Ivvanocich Khastov later Chairman of the Supreme Soviet, Russia on 8 August 1992; His Excellency Paul Raymond Borongov on 11 August 1992; Dn Estrade, President of World Cultural Council Mexico on 25 September 1992; and Brig. General George Yeo, Minister of Information and Arts, Singapore on 3rd February, 1993.

23. HAZARDUARI PALACE MUSEUM, MURSHIDABAD.— The work of providing wooden panels with sumnica veneering in the vacant wall portions parallel to the running showcases of the Gallery 2 of the armoury was completed in close symmetry to the Gallery 1.

The work of providing two glass casings was also completed for due protection and safety of a silver Tanjam and an ivory Tanjam of Shahjahan, displayed in the hall of royal exhibits.

The work of sorting and classification *of records, farmans* and other important documents in the record room was completed alongwith fumigation of books on oriental languages which are in brittle condition.

24. ARCHAEOLOGICAL MUSEUM, NAGARJUNAKONDA.— The work of anti-termite treatment was given to the false wall and showcases in the Gallery 1.

Halogen lamps were provided around the museum building as a security measure.

25. ARCHAEOLOGICAL MUSEUM. NALANDA.— A new gallery was organized and opened to the public. A beautiful image of Vishnu in black basalt was collected from Police Station, Asthawan, District Nalanda. The objects collected from Patna Circle were also documented and preserved.

26. CENTRAL MUSEUM, NAGPUR.— During the year under review, forty-seven objects were received and added to the museum Collection.

Two hundred thirty-one copper coins received from the Survey; one terracotta *Siva-linga* from Hardoda, District Yeotmal; one bronze umbrella from Hamalapuri, District Nagpur; and paintings of the museum were chemically cleaned and preserved.

27. ARCHAEOLOGICAL MUSEUM, PURANA QILA.— The wornout background cloth of the three wall showcases was replaced and the objects were displayed in two wall showcases.

28. ARCHAEOLOGICAL MUSEUM, RATNAGIRI.— Ninety-four stone sculptures and architectural pieces from excavation were shifted to the museum. The layout and plan of the galleries were drawn.

29. ARCHAEOLOGICAL MUSEUM, SARNATH.— The reorganization of the main hall and the renova tion of lock was completed.

30. TIPU SULTAN MUSEUM, SRIRANGAPATNA.— The work of alterations to the existing wall and triple sided showcase for a better display of the antiquities was completed.

31. ARCHAEOLOGICAL MUSEUM, VELHA GOA.— Showcase for the display of coins was prepared. Six wooden sculptures acquired from the Delhi customs were exhibited in the museum.

The work of providing shed over the statue of St. Catherine was completed.

The damaged showcase, glass panes of St. Peter's showcase were restored and the surrounding wall was painted.

The damaged wooden frame of the window in the key gallery was replaced and the glass panes refixed to the window.

Fixing of iron grills to the windows of the reserve collection was completed with painting in suitable colour.

Alluminium Louvre type glasses were fixed to the windows of the galleries. Three portraits of the Portuguese Bishops were displayed in the gallery. A laminated map of Goa was prepared and displayed in the key gallery.

VIII. ARCHITECTURAL SURVEY

TEMPLE SURVEY, NORTHERN REGION.—The Temple Survey Project (Northern Region), under B.L. Nagarch studied and surveyed the temples at Basai in district Datia (Madhya Pradesh).

The Dala-Jharesvara temple is dedicated to Siva and is located on a hillock on the eastern outskirts of village Basai. It is built of granite and consists on plan of two sanctums in a row, each having an *arddha-mandapa* in front. Sanctum 1 enshrines a Siva-linga installed on a yonipatta. The interior of the sanctum is plain though its rear wall is dilapidated. The sanctum-doorway is also plain and the door-sill is carved in the centre with a diamond design and on either side with elephant and lion motifs. The plain and flat ceiling of the *arddha-mandapa* is supported by two pillars, each of which consists of a square base carved with *a ghata-pallava,* and octagonal shaft and a *ghata-pallava* capital. The walls and flat ceiling of sanctum 2 are also plain. Inside this sanctum are kept fragments of sculptures assignable to the ninth century. The door-way of sanctum 2 is also plain. Sanctum 2 had also an *arddha-mandapa* in front, with ceiling supported by two pillars. Of these, only one pillar is now survived. The door-sill of the sanctum door-way shows in the centre a diamond design inside a panel flanked on either side by an elephant aid a lion motif. The stone-slab of the ceiling of the *arddha-mandapa* is carved with a fullblown lotus and is kept in front of the temple.

In elevation, the temple shows a plain *bhitta* surmounted by a *plain jangha* which in turn is capped by a plain *varandika* and flat roof. The temple, on stylistic ground is assignable to ninth century.

The Bhoraresvara Mahadeva temple, located on the western bank of the river Betwa near village Basai is datable to ninth century. It is a cave-temple and on plan consists of rock-cut sanctum and a modern structural *arddha-mandapa.* Inside the sanctum is installed a *chaturmukha Siva-linga.*

In addition to this, the new plan of Bijamandal at Vidisha in Madhya Pradesh was prepared after debris clearance.

BUILDING SURVEY.— H.N. Singh assisted by Daljit Singh, C.P. Satsangi, Sudhir Kumar, K.K. Verma, Kewal Singh, S.K. Sah and Raju of the Building Survey Project of the Survey carried out architectural survey of the fort at Akhegarh, Gangoora, Rajakhera, Ban and Mahwa in Rajasthan[1].

The site and village of Akhegarh (27° 13'; 77° 05') lies in tehsil Nadbai in district Bharatpur. By road it is about 56 km away from Bharatpur fort. Akhegarh is about 18 km by road from Nadbai town's railway crossing. The nearest rail-head is a town known as Kheedali, which, however, falls in district

[1] Its inclusion in this issue is because this report (submitted for *1991-92)* was received when the said number was in the final stage of printing.

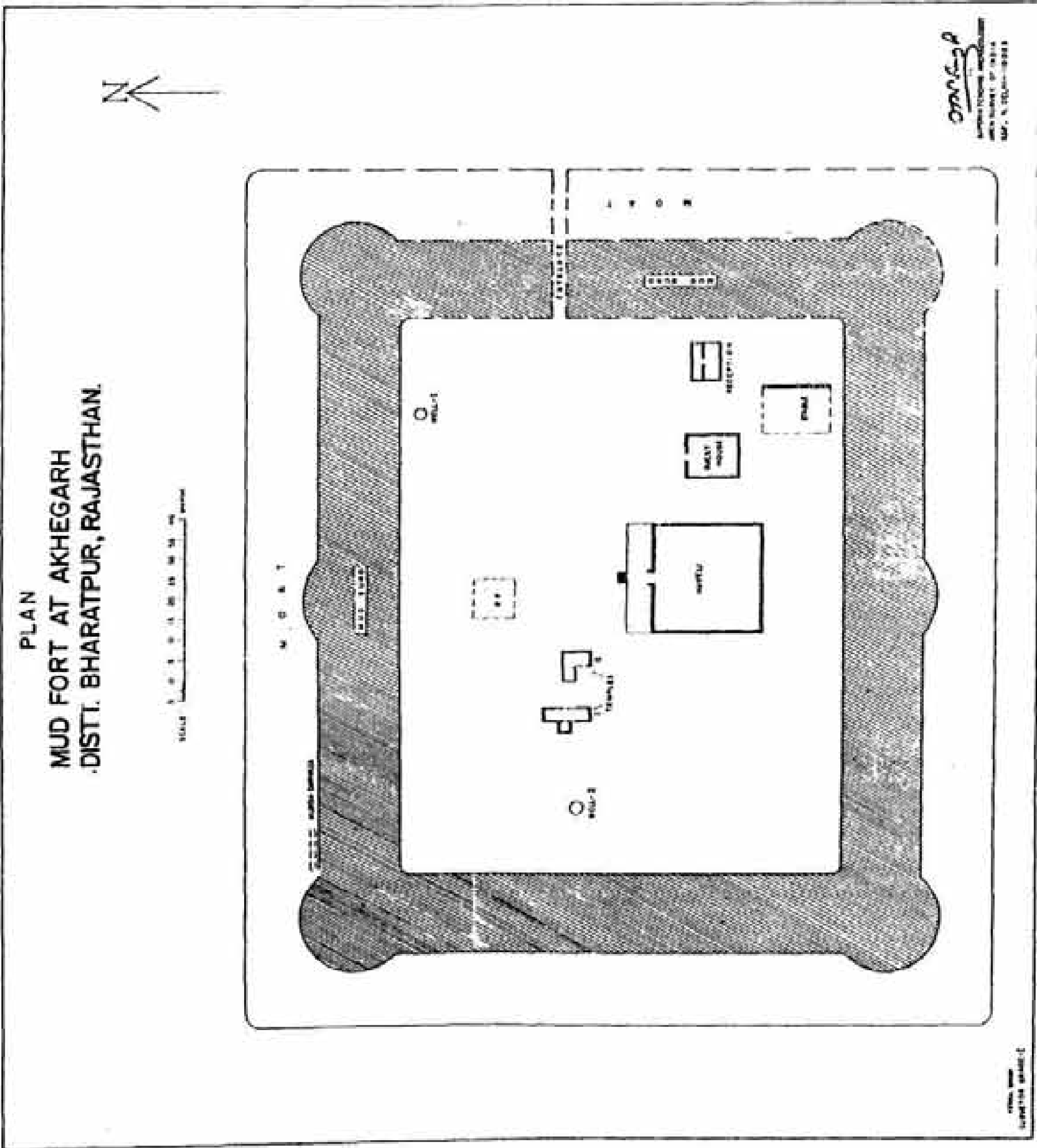

PLAN
MUD FORT AT AKHEGARH
DISTT. BHARATPUR, RAJASTHAN.
N
M O A T
M O A T

FIG. 19

Alwar. The Akhegarh fortress is comprised of fortification-wall of mud-bund, besides Raja's *haveli* and other associated contemporary buildings. The make-up of the mud-fortification wall is distinguished by the artificially created dump of manually accumulated pile of earth by digging the adjoining area on the outside causing thereby contemporaneously a deep ditch (moat) and a high defensive wall of mud-bund. The northern, southern and western arms of the mud-bund are extant but the eastern arm of the mud-fortification wall is totally lost due to some modern construction by the local villagers. The present opening in the western arm of the mud fort-wall appears to be a later addition, as the entrance of the fort was in all probability placed in the eastern direction. The mud fort-wall was suitably strengthened with semi-circular high-rising corner bastions, besides central roundish bastions in the southern and the northern arms of the mud-bund. The mud-fortress of Akhegarh is found to be rectangular on plan (fig. 19). Contemporary buildings inside the mud-fortress include Raja's *haveli,* guard-house, granary, stable, walls and temples. The Raja's *haveli* is a modest structure like any medieval building having a central courtyard with flanking rooms, halls and verandahs in all the principal directions. Random rubble masonry characterizes the walls. Use *of lakhauri* bricks is also rare. Wooden beams and rafters were used in the roofs of the staircases as well as in the *baradari,* located on the first floor. The variety of stone used include quartzite, spotted red sandstone and buff stone. The guard-house, built of undressed stones, is located about 100 m away from Raja's *haveli* towards the east. Of the granary building only the platform is extant, which is situated in the northwestern sector and in front of Raja's *haveli.* Of the stable-house, only the plan upto the plinth-level is available. It is located to the south-east of the Raja's *haveli* in the south-east sector of the fortification complex. The structural existence of two numbers each of walls and temples could be noticed within the fortified area. The Akhegarh mud-fortress is said to have been built during the time of the Jat ruler of Bharatpur Maharaja Jawahar Singh (AD 1764-1768) by his younger brother, namely, Akhe Singh, sometime during AD 1763-65.

The sprawling stone masonry fort at Gangoora (27° 43'; 77° 03') falls within the jurisdiction of sub-tehsil Pahari under tehsil Kaman in the district of Bharatpur. It is located at a distance of about 91 km by road (via Kumher, Deeg and Kaman towns) from Bharatpur fort. The village of Gangoora is situated at a distance of 6 km by *kachcha* road from Pahari town, which itself is located along the Pahari-Ferozpur-Fazilka road. While coming from the Kaman town direction by road for reaching the Gangoora village and fort, one has to take a turn towards the left at Pahari town, which is 84 km in distance from Bharatpur fort. The Gangoora fort itself is located at a distance of about 1 km from the village of Gangoora. Further, the route from Bharatpur fort to Pahari town is through *a pucca* road, while the approach from Pahari town to the Gangoora village and the fort is through a *kachcha* road (dirt-track). The village of Gangoora is located just on the border of two districts. Bharatpur (Rajasthan) and Gurgaon (Haryana) two. Unlike the forts of Bharatpur, Deeg and Kumher, the Gangoora fort is situated on a rocky hill in the mountainous terrain. Apart from the impressive stone fortification-wall, buildings of architectural interest are not many at Gangoora fort Mention may, however, be made of the ruined temple, tank and *serai,* besides the residential structures placed at the lower and upper ridges of the mountainous terrain. It may be remarked that the location of the Gangoora fort is mountainous. Therefore, the plan and elevation of the stone fort-wall is irregular and marked with undulations synchronizing with the various gorges dotting the rocky terrain. In extent, the fort is found to be fairly

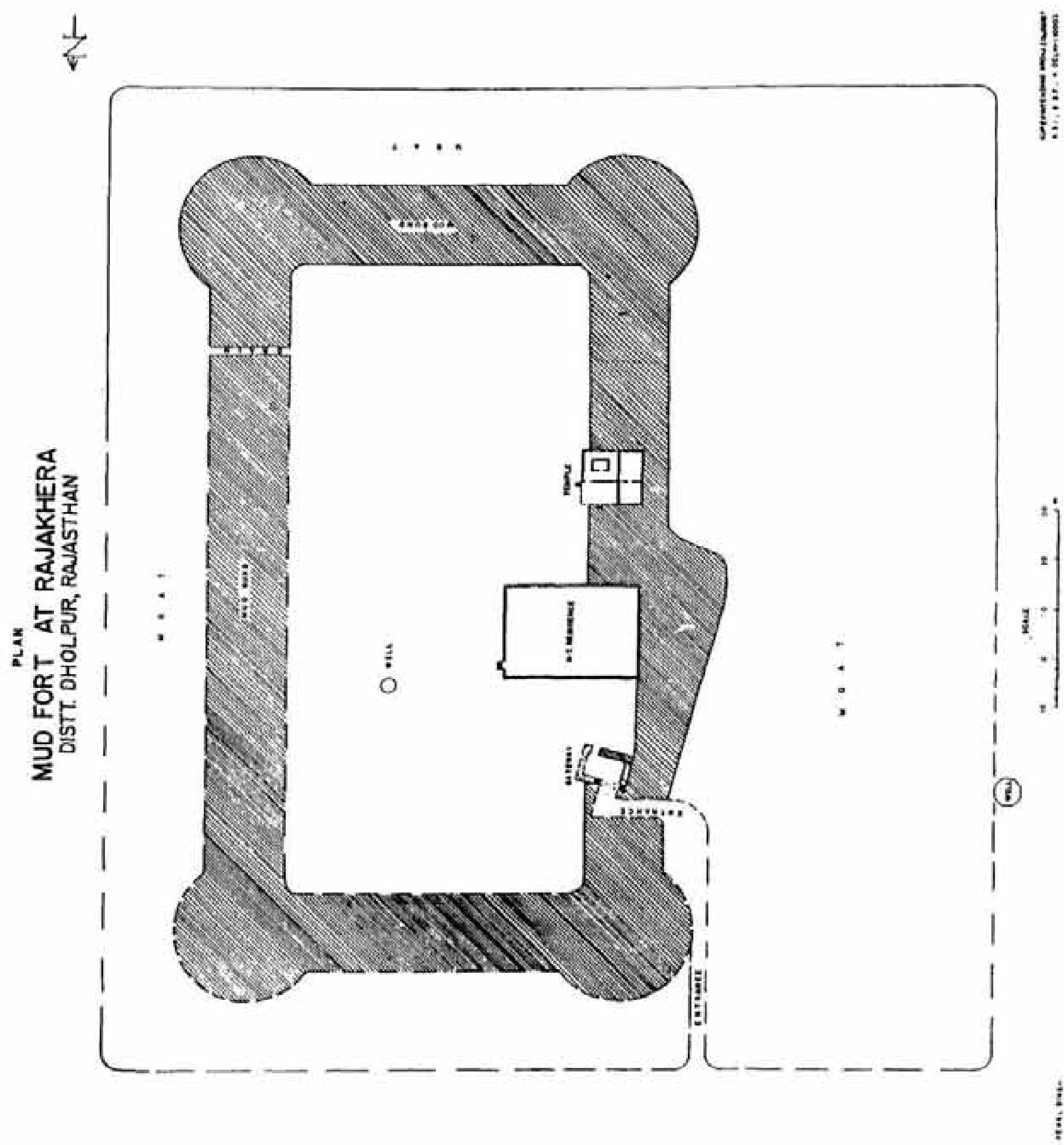

PLAN
MUD FORT AT RAJAKHERA
DISTT. DHOLPUR, RAJASTHAN
MOAT
ENTRANCE

FIG. 20

sprawling and extensive. The fortification-wall has been raised of the locally available quartzite stone by adopting the technique of course rubble masonry laid in lime mortar. The extant walls are found to be fairly high and pretty thick. So far as the foundation is concerned, it can be described as a free-built structure owing to the underlying bed-rock formation which provided natural solid base for raising the superstructure. The stone fortification-wall is further found strengthened with semi-circular bastions at regular distances. The top of the fort-wall is seen embellished with battlement dotted with two rows (lower and upper) of a series of arrow-slits *(tirakash)* at uninterrupted intervals. The northern fort-wall was also provided with a flight of steps near the gateway complex, which was accessible only from the inner side of the fortified area. This sort of construction was intended to facilitate the movement of the soldiers and others to the broad-topped and stone-parapeted walk on top of the fort-wall. The juxtaposed gateway-complex is extensively damaged and, therefore, only a small portion is extant. Located in the eastern sector of the fortified area on the vast plateau of a very high and rocky hill-top, the citadel is represented by an unpretentious residential building raised in coursed stone rubble masonry in lime mortar. Facing east this stone structure of modest dimensions in almost square on plan, of which the front portion including facade is extensively damaged. However, the western, northern and southern wings are still extant. It is further noted that the southern wing is provided with a flight of steps along its outer wall running east-west. With an open courtyard in the centre, the surrounding area is noted for a compact enclosure with bays at regular intervals and symmetrical arched openings towards the side of the courtyard. This building is also provided with subterranean rooms. Near this building are also seen the extant plans of a cluster of stone houses on the western sloping side, which appear to have functioned as guard-rooms appurtenant to the citadel. In the northern sector of the fortified area, the *kunda* (tank), *serai* (shelter-place) and temple are seen situated in one cluster along the *"Anjani-nallah".* Near the citadel but at a much lower level remains of rickety dwellings of stone rubbles, placed along the sloping range of the rocky terrain, were also noticed. Of these, the superstructures are missing; however, house-plans are extant. It appears that the *"giri-durga"* (hill-fort) of Gangoora was most probably built by the rulers of Amber in the thirteenth century AD.

There is a mud-fortress *(mrid-garhi)* at the outskirt of Rajakhera (26° 54'; 78° 11') township, which is also the tehsil headquarters under the jurisdiction of district Dholpur. The tehsil-office is situated inside the fortified area. The Rajakhera mud-fortress and town are connected by road with Bharatpur— a distance of 96 km. However, it is much closer to Agra. The site and town of Rajakhera are not connected by railway. The bus stand/station of the Rajasthan State Road Transport Corporation is situated just in front of the Rajakhera mud-fortress on its northern side. The fortress *(garhi)* is found to be roughly rectangular on plan. Elevation of the fortress is formed of massive mud-rampart wall pierced with the gateway - complex on the northern side. The mud defence-wall *(prakara)* is tapering and its extant top-line is irregular due mainly to the erosion. There is a vast moat *(parikha)* outside encircling the mud fort-wall. The fortress is also betraying corner bastions (fig.20), which are represented in the form of built-up earth and are higher in elevation than the top-line of the mud defence-wall. While the southeastern and southwestern corner bastions *(attalaka)* are quite imposing, the other two corner bastions are substantially reduced and diffused due to sustained robbing of the earth by the local inhabitants. It is seen that the entrance-gate *(gopura)* piercing the northern arm of the mud defence

wall is situated at its farthest western end. Facing north, the existing gateway of Rajakhera mud-fortress is modestly built in brick-masonry with an arched entrance-way. The use of *lakhauri* bricks, coursed in lime-mortar, is seen in the constructional make-up of the gateway-complex, the wall surface and other areas of which are treated with lime-plaster. On the outerside, the entry-passage to this north facing gateway is through a brick-on-edge paved ramp, the orientation of which is from west to east. The other enticing feature of the defensive architecture of the gateway-complex of Rajakhera mud-fortress is the fact that the rear surface of the brick-built western and southern enclosure walls are abutting in such a manner that the elevations of the brick-built walls (southern and western) of the gateway-complex are found completely concealed externally underneath the built-up earth pile of the mud defence-wall of the fortress. The facade of the entrance gateway is single storeyed- The top of the wall of the facade is strengthened by embattled parapet. Loopholes or arrow-slits *{tirakash)* are also seen in the brick-built wall of the facade. Inside the fortified area, a temple is found situated in the western sector. Built in brick-masonry, the temple structure is placed over a solid platform of average height. Placed along the western mud defence-wall and almost in the middle of the western sector, this modest sized temple *(deva-griha)* is facing north. The present structural status of the various secular buildings within the fortified area is such that by and large all of them have lost their originality due to subsequent additions and alterations. However, it may be mentioned here that almost all the extant secular buildings are seen situated near and along the western, southern and eastern mud defence-walls. The township of Rajakhera is said to have been established by Raja Man Singh Tonwar towards the close of the fifteenth century AD and, therefore, it was christened after him, i.e., the village *(khera)* of Raja (Rajakhera). However, the authorship of the old mud-fortress of Rajakhera is attributed to the Jat ruler of Bharatpur, namely, Raja Surajmal (AD 1734-1763).

Bari fort and township (26° 39'; 77" 37'), connected by an all-weather metalled road and served by a regular bus-service, is about 34 km from Dholpur city. Further, it is found situated to the west of the city of Dholpur within the jurisdiction of district Dholpur. Bari is also the tehsil headquarters bearing the same name. Situated on an elevated plateau of the countryside, Bari fort is characterized by four principal stone-masonry defence-walls. It is found to be roughly rectangular on plan. While the north-south axis of the fort-wall is longer, the east-west orientation of the fortification is comparatively shorter in length. High-rising stone masonry rampart strengthened by adding a series of bastions *(attalaka)* at regular intervals and pierced with two massive gateways denote the distinct elevation of the fort of Bari, which is also known as *Sarkari - Qila.* However, the fort-wall elevation on the northern side is found to be very high, which, as a matter of fact, represents the royal residential area. The Bari fort is also found specifically secured on the outerside by creation and location of the moat *(parikha).* The rampart *(prakara)* of the fort is built of ashlar stones. While the northern, western and southern fort-walls are by and large extant, the eastern fort wall is now extinct. However, the southeastern corner bastion (semi-circular) is extant. It is also seen that the fort-walls are appropriately provided with battlements and arrow-slits *{tirakash).* The entire fort is largely built of red sandstone of Dholpur variety with a fair sprinkling of buff-stone. The Bari fort was provided with two gates, *viz.,* western and eastern. The latter, however, is now largely extinct. The western-gate (Gandhi Park *Gate/Sadar-Darwaza)* is extant, intact and is in a very good state of preservation. It is a three-storeyed structure. Further, with a view to allow

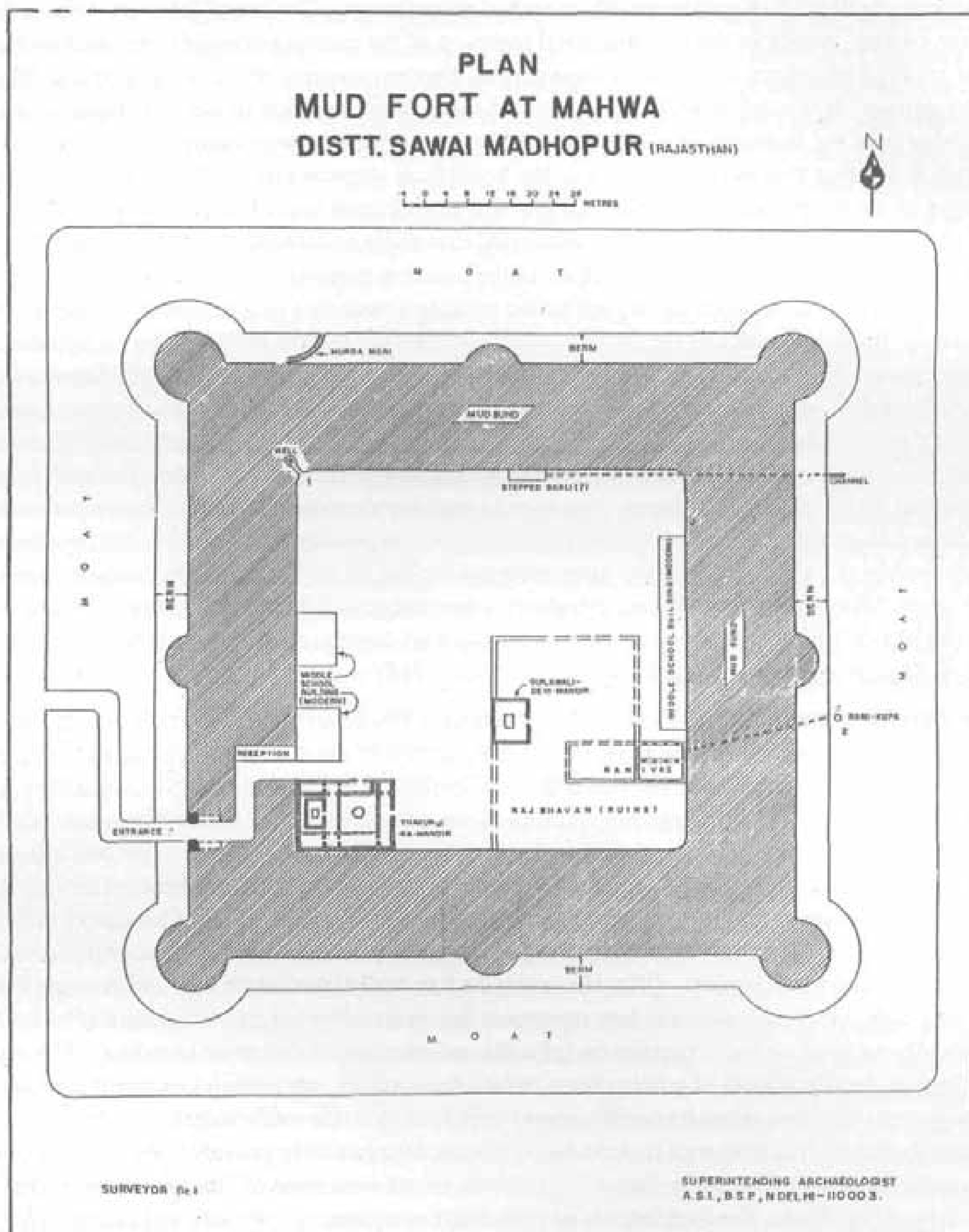

PLAN
MUD FORT AT MAHWA
DISTT. SAWAI MADHOPUR (RAJASTHAN)
N
METRES
M O A T
BERM
MUD BUND
STEPPED BAOLI(?)
CHANNEL
MIDDLE SCHOOL BUILDING (MODERN)
TULSIWALI DEVI MANDIR
RECEPTION
ENTRANCE
THAKURJI KA MANDIR
RAJ BHAVAN (RUINS)
SUPERINTENDING ARCHAEOLOGIST
A.S.I., B.S.P., N.DELHI-110003.
SURVEYOR

FIG. 21

vehicular traffic, the entrance-gate is provided with stone-paved ramp passage. Inside the fortified area, the contemporary royal residential complex *(Raja-Bhavari)* is seen situated in the north western sector in close proximity to the western gate. The royal residential area *{Raja-Bhavan)* is a magnificent and sprawling'complex with a majestic gateway and very high rising enclosure-wall. White its gateway is frontal and facing south, the ramp passage is lateral (east-west) instead of being frontal. The interior space *of the Raja-Bhavan* is seen divided into two (eastern and western) segments but both of them are inseparably inter-connected. While the eastern segment is known as *Raja-Mahal,* the western segment is called as *Rani-Mahal.* Mention may also be made of the provenance of a massive canon placed in-between the western gate and *the Raja-Bhavan* and to the north of the existing (east-westrunning) pMCca road. Just in front of the gateway of the *Raja-Bhavan (haveli)* across the east-west running *pucca* road is situated the contemporary temple. Built in stone-work and placed over a high platform, the *devalaya* is facing east. A huge contemporary wall lined in stone-work is seen situated in Ward no. 13 within the fortified area. Made conspicuous with a raised platform, the wall (now defunct) is octagonal on plan. The Ban fort seems to have been raised sometime in the beginning of the fifteenth century AD. It has, however, finally came under the sway of the Jat rulers of Dholpur/Bari towards the middle of the nineteenth century AD. Further, connected solely with the life and history of the fort of Ban are a couple of buildings which are located outside the fortified precincts. Of these, mention may be made of the *Maharaja-Bagh,* which is situated to the west of the Bari fort. It was raised as the royal summer resort by the Jat rulers of Dholpur/Bari. Rectangular plan, sprawling campus, two pavilions *{baradari:* northern and southern), two east-facing gateways (northern and southern), a couple of deep stone-lined wells *(kupagar),* high rising stone-built enclosure-walls *(prakara)* with bastions *(burgees)* constitute the chief architectural and structural features of *theMaharajaBaghof* Bari. It appears to have been built in the middle of the nineteenth century AD.

The mud-fortress *(Dhool-Kot)* is situated at the outskirt of the present township of Mahwa (27° 03'; 76° 56'), which is 146 km in distance from its district headquarters, i.e., Sawai Madhopur. Mahwa is also the tehsil headquarters under the control of Hindaun subdivision, which is connected with the former by road at a distance of 38 km. Mandawar is the nearest Railway station (16 km) which is also called as Mahwa Road station on the Agra-Ahmedabad metre gauge section of the western Railway. Further, Mahwa is situated at the intersection of Agra-Jaipur road and Mandawar- Karauli road. However, from Bharatpur town it is approachable by Agra-Jaipur road. It is found to be 56 km by road from Bharatpur fort. The site of the mud-fortress of Mahwa is about 1 km off and to the south-east of National highway no. 11 on Agra-Jaipur road. The mud-fortress of Mahwa is, in fact, situated near the Panchayat Samiti Office and to the rear side of the Aggrawal Dharmasala. The mud- fortress of Mahwa appears to be roughly squarish on plan (fig.21). The rampart of the fortress is represented by a massive mud-bund which is extant on all the four sides. The massive mud-rampart and the semi-circular earthen bastions alongwith the modestly built stone masonry gateway (on the western side) reflect the elevation of the fortress *(garhi).* Since the rampart is composed of mud-bund, it is tapering on either sides. Roundish mud-bastions *(attalaka)* placed at regular intervals have considerably strengthened the mud-bund *(prakara),* besides raising elevation of rampart of the fortress at regular intervals. The moat

parikha) situated on the outerside is fairly wide and pretty deep. On the innerside of the mud-fortress of Mahwa, there are a couple of contemporary buildings, which are primarily built of stone masonry. An additional feature in the formation of the mud-bund *(prakara)* is the sparse use of stones on the western and southern sides. Like the mud-fortress of Rajakhera, the Mahwa mud-fortress, too, is betraying only one gateway *(ekamukha-durga).* It is built of coarse stone rubble masonry with plastered wall surface and is facing west. The sky-line of the gateway is further distinguished by conical battlement, which comprises arrow-slits placed appropriately at two levels, i.e., upper and lower. Juxtaposed to the rear side of the gateway there are a couple of small-sized guard-rooms. On the innerside of this gateway, there appears to be yet another appurtenant entrance-gate, which is spatially juxtaposed to the reception-hall. With a view to all free flow of men and animals as well as the vehicular traffic, stone-paved ramp passage was provided to the gateway complex. Leg-work within the fortified-area revealed that while the residential buildings are seen clustered mainly in southeastern sector, the religious buildings are situated in the south-west. The northeastern as well as the northwestern sectors are largely open and are also moderately free from any building activities, excepting a well *(kupagar)* and other structures of minor descriptions. Situated in the southeastern sector, the superstructures of the royal residence *(Raja-Bhavan)* have fallen down and their debris alone are discernible at the site. A much dilapidated structure, now identified and called as *Ranivas or Rani-mahal* (royal female apartment), is presently being used as a school-building. Located in the southwestern sector within the fortified precincts, there is *deva-bhavan* or *deva-griha,* which is now known as *Thakurjee-ka-Mandir* (temple). It is a single storeyed structure of stone and lime mortar. Further, built with the formation of contiguous verandahs around an open courtyard, it is on plan betraying the familiar plan of the contemporary domestic houses of the region. The *garbhalaya* (sanctum sanctorum) is seen situated in the western side; the deities placed there in over a stone-built pedestal are, however, facing east. This modest building *{deva-bhavan)* has got two entrances, one each in the northern and eastern sides. Within the fortified area of Mahwa mud-fortress, there is yet another temple known *v-* s Durga Devi temple. It seems that this temple is an addition, subsequent to the desertion of the fortress. There is a reception-cum-waiting hall *(sampark-bhavan* or *pratikshalaya),* which is situated within the barbican area of the fortified precincts. The rear as well as the side wall of this structure are seen abutting the mud-bund of the fortification-wall. It is a remarkable feature of this *Bhavan* that its rear and side elevations stand completely concealed against the juxtaposed mud-bund when viewed from the outside area of the fort. This *Bhavan* is now abandoned. Further leg-work within the fortified area revealed the structural formation of *murda-mori* or *murda-darwaza* (crematory gate or passage) in the northwestern sector. Designed in the shape of a tunnel, it is built of stone and lime mortar. This sturdily built structure is seen situated collaterally along the outer slope of the northern mud-bund of the fortification-wall in the near vicinity and to the north *of the pucca* (now dried-up) well. Constructionally, the structure is sloping from one (upper) end to the other (lower) end. While the lower end is situated in the basin of the moat *(parikha),* its upper end is seen synchronizing level-wise with the crest of the northern mud-bund. Its interior is studded with a structural stairway, instead of a sloped ramp passage. This structure is still known as *murda-mori.* It is a common knowledge that structurally *mori* is an outlet. From its present nomenclature, it can be reasonably presumed that this unique

structure was used as an outlet for the dead bodies *(murda)*. In other words, this unique construction was most probably a crematory-passage for taking out human dead bodies from the fortified precincts of the Mahwa mud-fortress for performing their last rites. Apart from this, mention may also be made of two deep wells and one stepped *baoli.* Of the former, it is seen that while one well *(kupagar)* is situated within the fortified area, the other well *(Rani-kupa)* is located in the basin of the moat. Finally, it appears that the mud-fortress of Mahwa was in all probability founded and built around three hundred years ago during the time of Sawai Jai Singh (AD 1700-1743) of Amber/Jaipur State.

Situated along the Agra Bharatpur-Jaipur N.H. No. 11, the fortress and village of Ghanteeri Thekra (27° 02; 76° 54') falls under the tehsil of Mahwa in district Sawai Madhopur. It actually stands located about 02 km away from the bustling township of Mahwa towards Jaipur side. As the fortress stands slightly off to the south of the N.H., it is quite conveniently approachable by a cart-track. Since the fortress is situated over a hillock *(thekra),* one has to climb-up through a winding, narrow and steep stairsway built recently in stone masonry. The township of Mahwa is found to be 56 km away by road from the medieval Jat fort of Bharatpur. Resting over the crest of the ridge of the mountain range, the makeup of the fort of Ghanteeri Thekra testifies the fact that, like Gangoora fort (district Bharatpur), it is yet another example of *giri-durga* (hill-fort) nestled in the eastern part of Rajasthan. Considered in the light of the structural formation, the fort of Ghanteeri Thekra, unlike Gangoora fort can at best be described as a small fort or a fortress *(garhi).* The structural composition of the fortress is distinguished by the use of stone rubble masonry, lime plaster and mortar as well as mud mortar. The fortress of Ghanteeri Thekra is rectangular on plan. While the north-south axis is shorter, the east-west orientation is larger (fig.22). In extent, it may be around 150 m in length (east-west) and about 50 m in width (north-south). Built in stone masonry the high rising fort walls, semi-circular bastions and a modest sized gateway signify the elevation of the fortress. Foot-work at the site revealed that their exists a mini-fortress within the fortress. The inner or mini-fortress, which is constructionally double-storeyed, seem to signify the citadel. The *prakara* (rampart) of the fortess is constituted of a pair of outer (larger) and inner (smaller) fortification walls. The massive *prakara* is found to be built with stone rubbles of varying shapes and sizes reflecting therein the deft application of the methodology of coursed stone masonry. The inner as well as the outer wall surface of the *prakara* is still seen largely coated with lime plaster. A close examination of the fort-wall formation revealed two structural periods, which is distinctly discernible in the randomly exposed transverse section as well as on the plan. Further, the inner (smaller) as well as the outer (larger) fortification-walls *(prakara)* are seen provided construction-ally with numerous arrow-slits *(tirakash),* which were consciously caused to be created at different levels of the wall surface. Leg-work also revealed the formation of battlemented parapet along the apex of the *prakara* (fort-wall). It may be mentioned that the *prakara* (rampart) of the *garhi* (fortress) is studded with pretty massive bastions *(attalaka).* They are perceivable in both the fortification-walls, i.e., outer *prakara* and inner *prakara.* Constructionally, they are semi-circular in formation, besides being situated at their assigned places at determined distances. While the inner fortification-wall *(prakara)* of the citadel is betraying only four bastions *(attalaka)* at their cardinal corners, there are as many as six bastions in the outer fortification wall *(prakara)* of the *garhi* (fortress). Thus in all as many

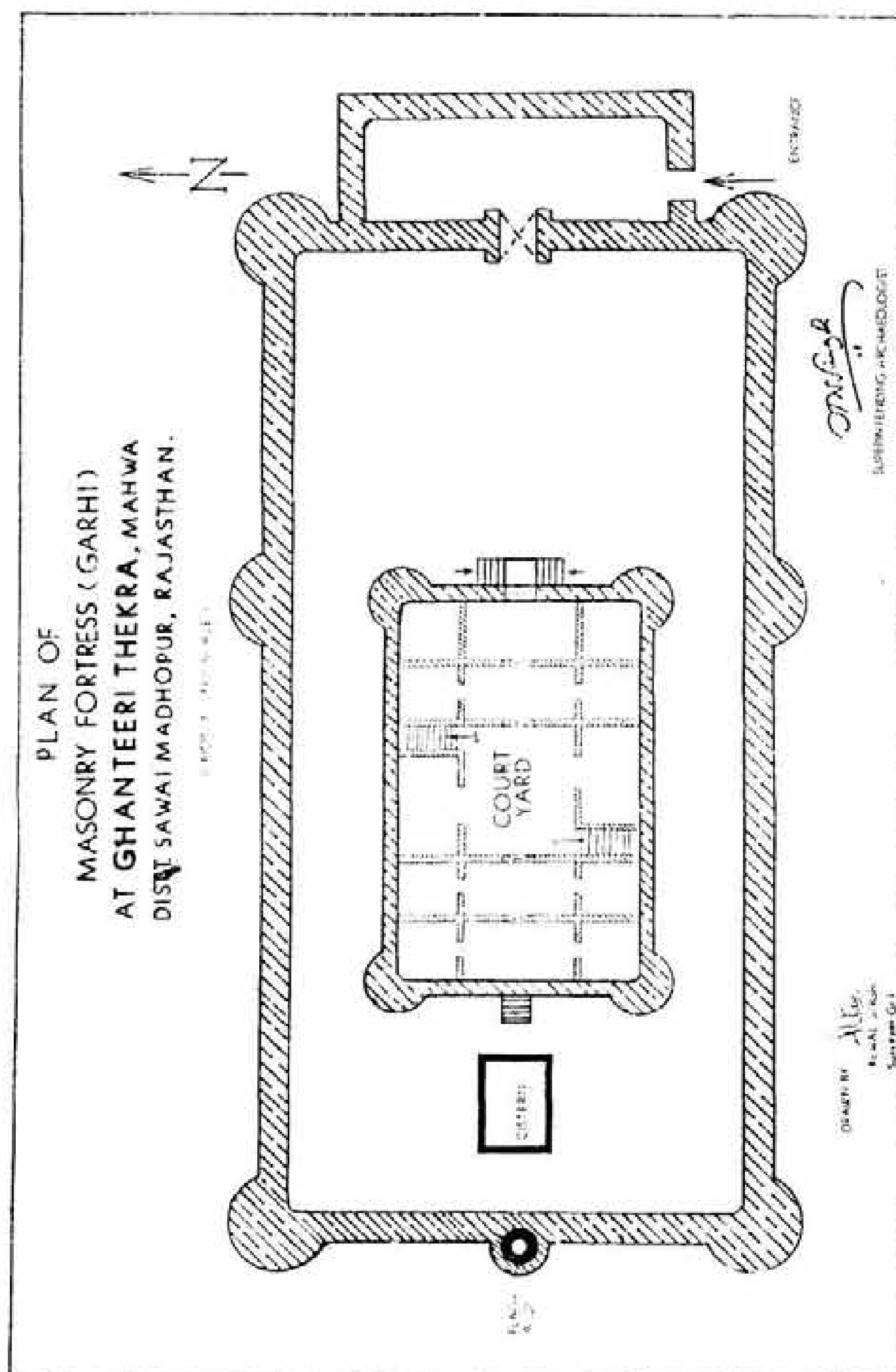

PLAN OF
MASONRY FORTRESS (GARHI)
AT GHANTEERI THEKRA, MAHWA
DISTT SAWAI MADHOPUR, RAJASTHAN.
COURT YARD

FIG. 22

as ten bastions *(attalaka)* are provided to the *garhi* (fortress). Placed in the rear structural formation of the western fortification-wall, there is a flag-post *(dhvaja-stambha),* which is a solid semi-circular construction in stone masonry. In its centre, there is a circular device in stone masonry to receive and hold the flag-post. The Ghanteeri Thekra *garhi* (fortress) is *ekamukha-durga.* In other words, it may be stated that only one gateway *(dvara)'is* provided to the fortress. While the gateway itself is facing east, the entry, however, is regulated through an enclosure or barbican, which has an entrance on its southern side. Its facade is seemingly in a very good state of preservation. While the inner or lower formation of the recessed arch-opening is plain, the outer or upper curve of the arch is cuspidal. The ground surface of the entrance-passage is sloping, which appears to have been consciously created with a view to allow free flow of the vehicular traffic. Further, the gateway portion of the facade is seen marginally projected, besides being constructionally crowned with mainiature domes on either side with drooping convex roof design *(chandrakona)* in the centre, which can be seen deftly placed over the apex of the arched gateway. Also, the uppermost segment of the facade is betraying systematically built series of arrow-slits *(tirakash)* at varying levels and distances. The contemporary approach-way from the foot of the hill to the gateway complex of the *garhi* (fortress) is winding and skillfully laid by cutting and levelling the rugged sloping land formation of the hillock. The inside area of the *garhi* is containing virtually a *mini-garhi* or mini-fortress, which seems to denote the citadel *(Raja-Bhavan).* Bui It of stone masonry, a large sized rectangular cistern *(jala-kunda)* is the only other structural activity noticeable within the fortified (outer) precincts. It is situated to the immediate west of the *mini-garhi.* No direct datable evidence could be retrieved in and around the fortress. However, considered in the light of the present (AD 1993) status of the state of dilapidation *vis-a-vis* preservation of the various structural formations, their constructional styles and architectural features including the kind of various building materials used in raising and repairing the fortress, the explorer is inclined to presume that the masonry fortress of Ghanteeri Thekra appears, as on to-date to be around 300 years old.

Connected by an all-weather metalled road and served by regular bus service, Ban township is about 34 km by road to the west of the city of Dholpur. The town and tehsil of Bari comes under the jurisdiction of Dholpur. The Pathan-Qila (26° 41'; 77' 37'), also known as *Gumat-Qila* or *Jagir-Garhi-Qilana* or *Pathano-ka-Qila* or Afghan-fort or Pathan-fort (pl. XXXV A) is located in the northernmost extremity of the sprawling township of Bari. Situated in Ward 1, the site may be around 2 km away, to the north of the railway station of Bari. As narrated by the present owner and occupant of the fortress, it was principally intended to function as a fortified residential complex *(Rihayashi-Qila).* Like the *Sarkari-Qila* of Bari, it is also a masonry fortress. However, unlike the *Sarkari-Qila* it is comparatively smaller in extent and shorter in dimension and, therefore, it may be dubbed as a *garhi* or a fortress. The masonry fortress of *Pathan-Qila* appears to be roughly rectangular on plan (fig.23). Pretty high rising rampart-wall *(prakara),* built in stone masonry with a couple of semi-circular bastions *{attalaka)* and a gateway reflect the elevation of the fortress. On an average the rampart *(prakara)* appears to be around 18-20 m in height. As regards the extent, it is observed that the east-west axis is longer than the north-south formation of the *garhi.* In length it may be around 180-200 m, whereas it appears to admeasure about 170-175 m in width. Like the masonry fortress of Ghanteeri Thekra, *Pathan-Qila* is also having a single gateway *{ekamukha-durga),* which is facing west. Therefore, the fortress of *Pathan-Qila* of

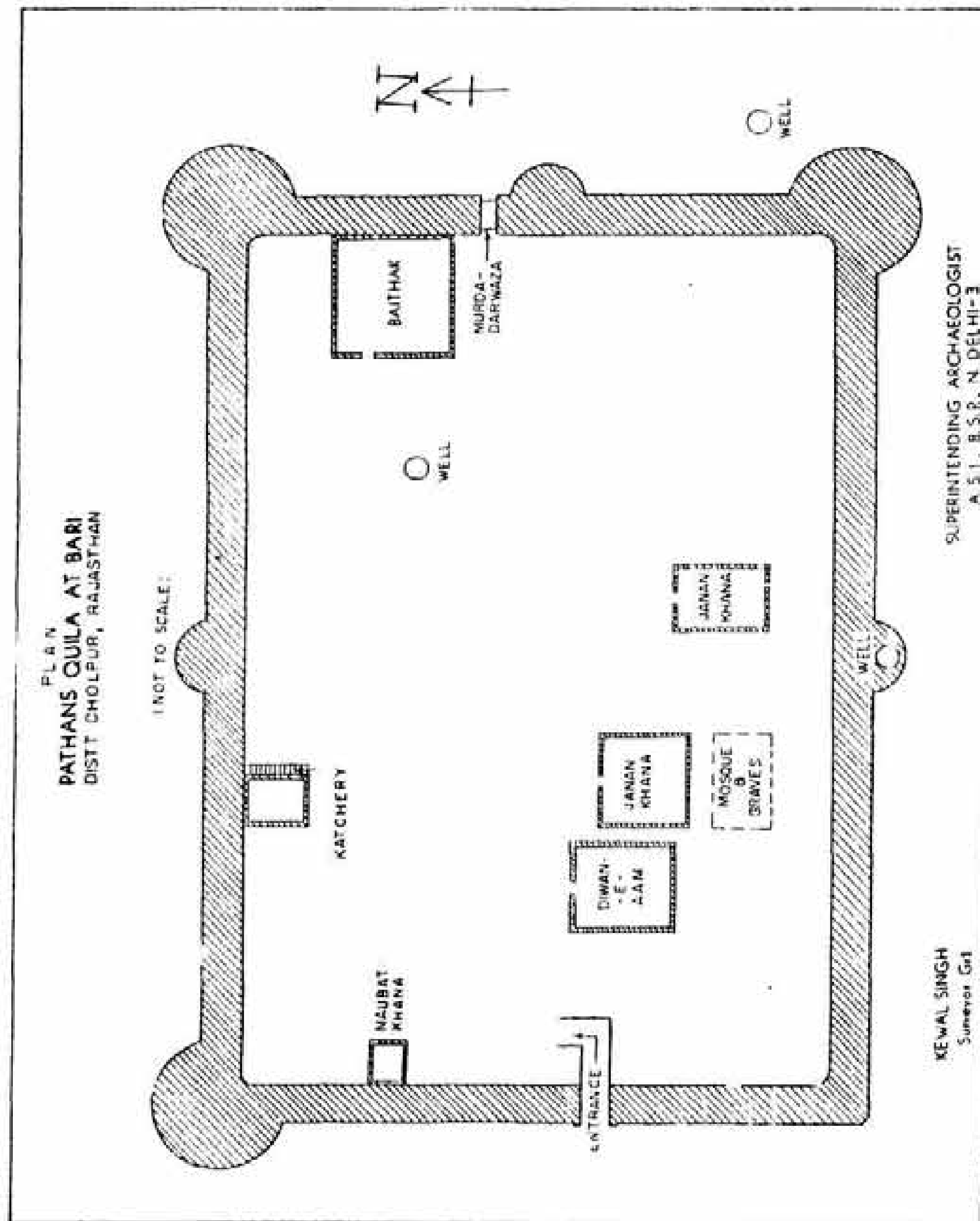

PLAN
PATHANS QUILA AT BARI
DISTT DHOLPUR, RAJASTHAN
(NOT TO SCALE)
N
WELL
BAITHAK
MURDA-DARWAZA
WELL
JANAN KHANA
WELL
JANAN KHANA
MOSQUE & GRAVES
KATCHERY
DIWAN-E-AAM
NAUBAT KHANA
ENTRANCE
SUPERINTENDING ARCHAEOLOGIST
A.S.I., B.S.R., N. DELHI-3
KEWAL SINGH
Surveyor Gr.I

Fig. 23

Bari may be described as *ekamukha-durga.* Unlike Bari's *Sarkari-Qila,* the entrance-passage of *Pathan-Qila* is winding and 'L'- shaped on plan. The rectangular facade of the gateway is construction-ally projected with reference to the *prakara* (rampart). With a view to allow smooth flow of human and vehicular traffic, the gateway complex is provided with stone-paved ramp passage. The wooden door-leaves of the gateway are extant and still functional. Further, the gateway is found to be three-storeyed. The structural wall surface of the facade is covered with veneer stones of Dholpur variety of red sandstone with a sparse sprinkling of buff sandstones, too. Significantly, the gateway is still in a very good state of preservation. Similarly, the *prakara* (fortification wall), too, is still structurally very sound and is in a very good state of preservation. The basal width of the *prakara* (rampart) is more than its slender apex. The wall structure is built in dressed stones, the regular courses of which are seen laid in lime-mortar. As a measure of defensive device arrow-slits *(tirakash)* are seen provided to the fortification wall at regular intervals as well as at different levels including the various bastion and the gateway-complex. The summit of *the prakara* (rampart) is found crowned with an array of battlemented parapet, which, too, is in a fairly good state of preservation. Further, with a view to prevent the percolation of water in the body of the wall structure, the mirlon of the parapet is seen covered with a thick coating of lime-plaster. Endowed with pretty conspicuous dimensions, the bastions, *(attalaka)* of *Pathan-Qila* are still fairly intact and well preserved. It is also seen that the crest of each bastion *(attalaka)* is higher in elevation than the top-line of *the prakara* (rampart). Leg-work within the fortified precincts revealed that while the *shahi zananakhana* (royal female apartment) was found situated in the southern-sector, the northern-sector contained the *shahi rihayashi kothi* (royal residential building) for the males as well as the royal-court *(shahi katchery),* leaving wide open space in the centre between both the sectors. Apart from the above, a couple of other structures of minor description including a huge well *(kupagar)* were also encountered within the fort area. Quite remarkably this *garhi* is still under the physical occupation and control of the Pathans, that is why it is still called *Pathan-Qila* or *Pathano-ka-Qila,* who claim their unfailing descent from Sher Shah Suri. Therefore, it may be reasonably surmized that this fortress was probably built by the Pathans in *circa* AD 1540 during the life time of Sher Shah Suri.

The site and village of Aligarh stands located to the north of Bari's *Sarkari-Qila* and *Pathan-Qila.* It may approximately be around 3 km away on north from the above mentioned *Pathan-Qila* of Bari, whence Aligarh is approachable by a dusty cart-track. Aligarh (26° 44'; 77° 37') is a tiny village and the ancient fort site is found situated just along the western periphery of the village as one travells by the dust road from *Pathan-Qila* of Bari. The most clinching clue for a visitor wishing to reach the site is the location of the permanent building of a Government School, which is found situated right on the top of the mound of the mud-fortress of Aligarh. As to-date the tiny village of Aligarh falls under the jurisdiction of Bari municipality and reflects its northernmost boundary. Aligarh is a mud-fortress. Its smallness in size and dimension persuades the explorer to classify it as a *garhi* (fortress) or a small fort. On plan, the mud-fortress of Aligarh is roughly squarish (fig. 24). Its much defused mud-bund reflects the extant elevation of the original fort-wall formation, which at present is of a very low height. The south-west corner roundish mud-bastion which is still fairly intact and compact, reveals that in terms

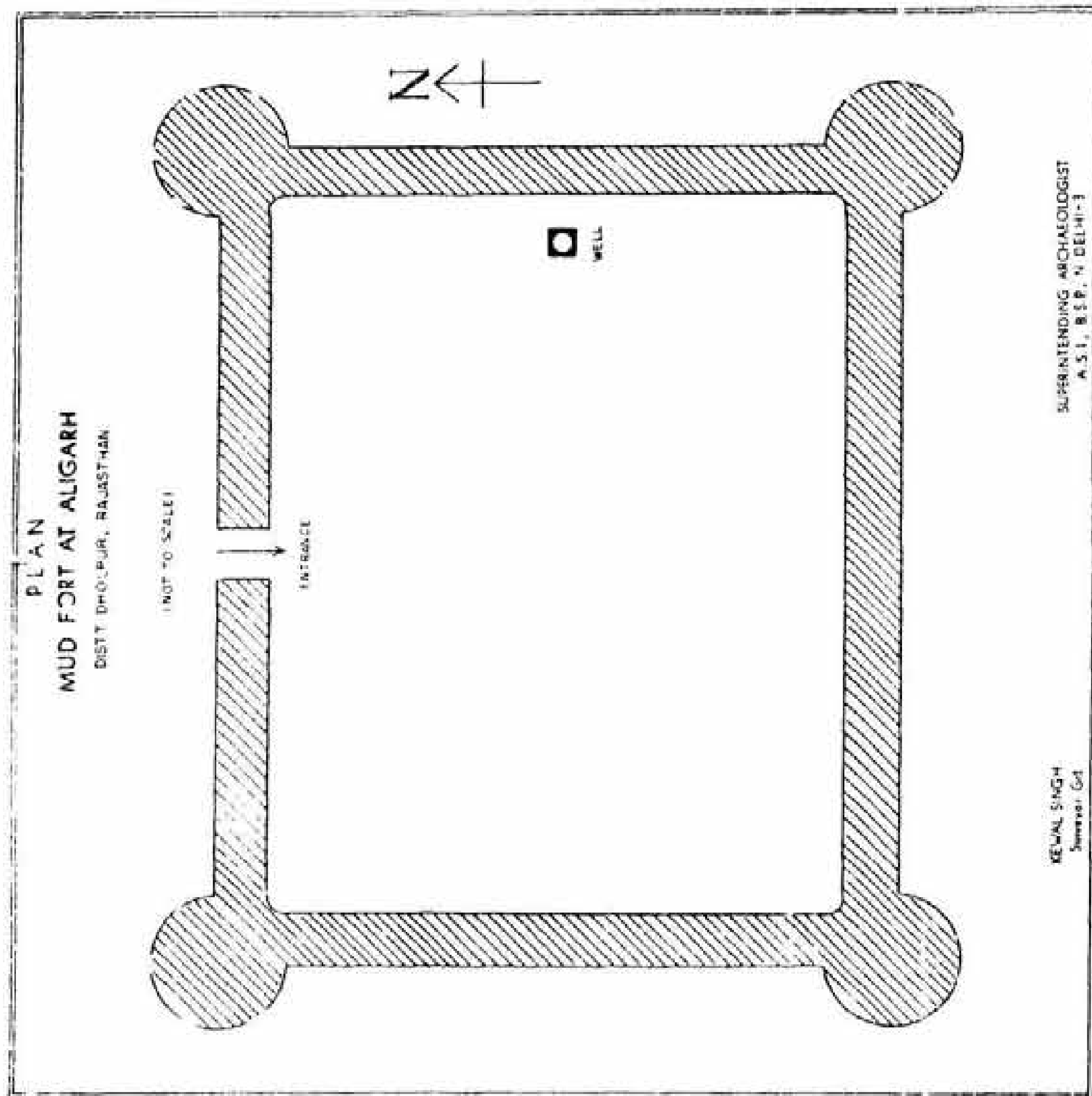

PLAN
MUD FORT AT ALIGARH
DISTT DHOLPUR, RAJASTHAN
(NOT TO SCALE)
ENTRANCE
WELL
SUPERINTENDING ARCHAEOLOGIST
KEWAL SINGH

FIG. 24

of elevation the mud-bastion *(attalaka)* is much higher than the extant mud fort-wall *(prakara)*. In spatial extent the *garhi* (mud-fortress) may be admeasuring around 50m x 50m. The present status of the fortress reveals that due partly to soil erosion but largely owing to human vandalism the original form and composition of the *garhi* (fortress) stands extensively eroded or obliterated. The compact earth of the mud-bund of the fort formation has been wantonly dug and carted away by the local villagers for raising or repairing their *kachcha* huts and houses, as a result of which the mud fort-wall could be noticed in traces only. Similarly, the mud-bastions *(.attalaka),* too have been extensively damaged by cutting and removing the earth by the local inhabitants. Surprisingly, the south-west corner roundish mud-bastion *(attalaka)* is still fairly intact and compact. An inspection of the site revealed that the mud-fortress of Aligarh is raised over an artificial mound *(vapra)* of earth. Of all the four sides, it is the southern side where the moat formation *(parikha)* could be tangibly discerned by the explorer. However on the other three sides it appears to have been filled up with earth. The gateway of the *garhi* (fortress) is now not extant; however, the elevated fortified precincts is reached at present through a sloping and straight passage, which is situated on the northern side. The *prakara* (rampart) of the Aligarh fortress is composed of mud which as on today stands largely defused. However, the plan of the *mud prakara* (rampart) can still be seen on all the four sides. Like the *vapra* (artificial-mound) *and prakara* (rampart), the *attalaka* (bastion), too, is built in mud. However, while the south-west corner bastion *(attalaka),* which is semi-circular on plan, is still in a good state of preservation, rest of the corner bastions stand almost obliterated due to indiscriminate digging of its made-up earth by the local villages. Contemporary old buildings or structures are totally missing within the fortified precincts. It appears that the old buildings were pulled down before raising the new buildings for the Government Primary School. A solitary well *(kupagar)* found situated in the south-east sector within the fortified area is the only old structural remnant, which can be presumed to be contemporaneous with the original formation of this old mud-fortress *(garhi)* of Aligarh. So far as the dating is concerned, it may be observed that the mud-fortress *(garhi)* of Aligarh appears to have been built sometimes during the end of the eighteenth century or in the beginning of the nineteenth century AD by the Pathan rulers and the ancestors of the present owner and occupant of *Pathan-Qila* of Bari, district Dholpur, Rajasthan.

The fort site of Dhool-Kot is situated within the municipal limit of Dholpur city. The town itself is situated at a distance of about 54 km from Agra and is on the main National Highway from Agra to Bombay. At present the city of Dholpur is the Headquarters of the district of Dholpur. Further, the site and the area identified by the explorer as Dhool-Kot (mud-fort), is located along and to the north of a very busy road of Dholpur city, which is still known as Dhool-Kot road. However, at present a housing colony, namely, Pratap Vihar, is coming up very briskly at and around the ancient site of Dhool-Kot. The very name Dhool-Kot itself denotes mud-fort *(mahi-durga or earth-fort)*. Foot-work at and around the fort site revealed that while the eastern, northern and western wing of the mud-bund of Dhool-Kot are extant in traces, the southern mud-bund stands completely obliterated. On plan, the fort appears to be roughtly rectangular.

In spatial extent it is observed that Dhool-Kot is not much large-sized, hence, it can at best be described as *garhi* or fortress. The fort formation is devoid of built-up artificial mound *(vapra)*. Further,

the formation like *parikha* (moat) is now not extant. The extant gateway is built largely of stones, besides the limited use of *lakhauri* bricks. The facade of the east facing gateway is treated with large sized veneer stones. The doorway has an arched opening and is a single storeyed building in elevation. On its immediate west, the gateway complex had an appurtenant huge building *(kothi).* The east facing modest sized gateway is seen placed along the eastern mud-bund of *the prakara* (rampart). It is further observed that the *prakara* of the fortress of Dhool-Kot is composed of artifically made-up mud-bund. However, it is available in traces only on the eastern, northern and western sides, but, on the southern side it is now totally extinct due to large-scale human vandalism. Even on the eastern, northern and western sides, the mud-bund if found in a much defused form. The apex as well as the outer slope of the extant defensive mud-bund is now largely encroached and occupied by modern pucca and *kachcha* houses. The modern housing activities over the apex as well as along the outer slope of the defensive mud-bund *(prakara)* is so dense and nucleated that even the stone-built facade of the east facing gate way could not be photographed for want of open space on its front side. Due to complete obliteration of the southern defensive mud-bund as well as owing to extensive encroachment over the top and outer slope of the northern, eastern and western mud-bund, bastion *(attalaka)* formations, if any, could not be discerned around the fortified precincts. Apart from the extensively damaged *kothi* (building) near the eastern gateway, mention may be made of the original contemporary well *(kupagar)* seen situated in the western sector of the fortified area, which is also containing a non-functional structural fountain in its central sector. Situated outside the fortress and to the immediate west of Dhool-Kot and Agra-Bombay G.T. road, there are a couple of structures or structural complex which appear to be cognately affiliated to the mud-fortress of Dhool-Kot, to wit, (i) *Chopad-Kund* or *Ram-Kund* (AD 1856-57), (ii) *Chopad-Mahadeo* or *Kailash-Dham* (AD 1856-57), (iii) *Maharaja-Bagh* (pl. XXXV B) or *Ram-Bagh* or *Aram-Bagh* (AD 1856-57). It appears that the mud-fortress of Dhool-Kot alongwith its appurtenant structures were probably conceived and developed during the lifetime of Maharaja Rana Bhagwant Singh in-between AD 1836-1856, with a very strong possibility that the mud-fortress of Dhool-Kot might have been constructed even earlier than Maharaja Rana Bhagwant Singh, who might have subsequently upgraded Dhool-Kot by way of extensive repairs, additions and alterations as was done by him in case of Ban's *Sarkari-Qila* and *Talab-Shahi.* It may therefore, not be unreasonable to conjecture that the mud-fortress of Dhool-Kot of Dholpur city, too, like other similar mud-fortresses of the adjoining region, might have been originally built in the beginning of the eighteenth century AD.

The Building Survey Project of the Directorate of Archaeology, Government of Gujarat under the direction of A.D. Gosai, reported a total number of fifty-seven buildings with wood carvings, *havelis* in the districts of Ahmedabad, Jamnagar, Bhuj and Rajkot.

IX. PRESERVATION OF MONUMENTS

MONUMENTS OF NATIONAL IMPORTANCE

Agra Circle

UTTAR PRADESH

1. AGRA PORT, AGRA, DISTRICT AGRA.—Restoration of red sandstone flooring of the Diwan-i-Am on the north-east corner, was taken up. *Lakhauri* brick masonry wall of the Ratan Singh-ki-Haveli in the inner quadrangle was repaired by underpinning the cavities, recessed pointing of the joints and by plastering. Anguri Bagh was repaired by underpinning with *lakhauri* brick-work and plastering. The ornamental work *(pachchikari)* was also restored with special lime mortar. The underpinning with *lakhauri* brick, recessed pointing and plastering were attended to in the Mina Bazar Complex. Apron of well-dressed red sandstone slabs was provided along the western facade of the Jahangiri Mahal to check the rain-water seepage to the foundation of the structure. The southern portion of the fort wall lying to the west of Amar Singh Gate was repaired by providing and fixing of missing and decayed veneering, *dasa, quaid* stones including carved stones of *kanguras*. Besides, masonry work with *lakhauri* bricks and plastering of the *kanguras* were also attended to.

The restoration of the east side minar of the Jama Masjid by way of laying RCC slabs at the base and beams at junction is in progress. The red sandstone *gala, farandah* and *dab* were provided. The preparation of white marble inlay pieces is in progress.

2. TAJ MAHAL, AGRA, DISTRICT AGRA.— Open joints of marble veneerinng on the eastern side of the main mausoleum were filled up with special lime mortar to prevent water seepage. Decayed inlaid panels on outer facade, wherever necessary were reset and restored as per original. Inlay work of the marble railing of the terrace was restored by providing inlay bars of black marble. Decayed red sandstone *jali* of the railing towards the south of the main building was taken up for restoraton and the work is in progress.

Pointing of the joints of red sandstone veneering in the Mehman Khana was attended to and a portion of damaged border with carved floral patterns on the facade of central arch was also restored as per original. In the same facade inlay work of *guldasta* was also attended to by providing inlay bars of black and white marble. Besides, the bulged and disloged heavy veneering stones on the exterior of the southern side were taken out and reset.

The red sandstone carved panels having floral patterns at plinth level on the eastern side of main entrance gate were restored with new ones as per original pattern (pl. XXXVI). Inlay work was attended to by providing black and white marble bars at the panels flanking the niches of western and southern facade. Decayed red sandstone pilaster was replaced by new ones.

In the eastern side *dalan,* flanking main gate decayed red sandstone of the veneering were replaced by providing new ones including *quaid* and *dab* and the open joints up to *taqari* level were pointed.

The missing red sandstone ornamental ya/i'-railing with *muttakas* on northwestern Saheli Burj was restored matching the original and western boundaries provided with M.S. grill railing and at the main entrance. The overhead tank in the Khan-i-Alam Bagh was repaired by underpinning, pointing and water proof coating. A damaged portion of the western side compound wall and steps leading to Khan-i-Alam Khirki were repaired.

The underpinning with *lakhauri* bricks and plastering of the walls and ceilings of the rooms of the eastern enclosure of the *gausala* was carried out.

Besides, the copper lightning conductors at main entrance gate and two minars standing on southeastern and southwestern corners of the main mausoleum were installed. A new cable line over the eastern and western side enclosure wall of the Taj complex was laid for security of the monument. An underground electric cable line was laid to connect the pedestal lamps fixed in the forecourt and lamp repaired.

3. TOMB OF SADIQ KHAN AND SALAWAT KHAN, AGRA, DISTRICT AGRA.— Arches and ceiling of the domed building were repaired by underpinning and restoring the decayed red sandstone flooring.

4. KOS MINAR AND CHHATRI ON THE AGRA-MATHURA ROAD, DISTRICT AGRA.— The Kos Minar was repaired by underpinning and plastering and an iron grill railing was provided to enclose the monument for the *chhatri* were removed and restored and enclosure wall provided.

5. KOS MINAR III AND IV ON THE AGRA-MATHURA ROAD, DISTRICT AGRA.— Both the Kos Minars were repaired by underpinning and plastering.

6. GROUP OF MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA.— Decayed and worn-out inlay panels of Badshahi Gate of the Jama Masjid were restored. Collapsed wall of the Diwan-i-Am was restored with coarsed rubble masonry.

The masonry wall was pointed and plastered. Decayed and old roof concrete of the Record Office *{Daftarkhana)* was replaced by a mixture of brick-ballast, lime and cement. The decayed *dasa* stone of Baradari near Khush Mahal were replaced with new ones. The flooring was provided with well-dressed red sandstone. The *dab* stones of the plinth were fixed below the *pandar dasa.* In the south, south-west and south-east sides, the red sandstone vaneering at plinth level was restored. A new *chaukhata* (door frame) fashioned out of red sandstone was provided at the northern side door. Besides, the pathways from fountain to Turkish Sultan's palace were restored by providing red sandstone carpeting and *dasa* stones.

7. AKBAR'S TOMB, SIKANDRA, DISTRICT AGRA.—The restoration work of north side causeway with rea sandstone flooring is in progress. The damaged western side causeway was repaired and pointed. Besides, the water tank in the centre of causeway was plastered after removing the decayed plaster. A well in the deer-park was repaired by underpinning with stone-rubble masonry.

8. OCTAGONAL WELL, MUJHERA, DISTRICT MUZAFFARNAGAR.—The repairs to the well was taken up by underpinning the pointing. The work is in progress.

Bangalore Circle

KARNATAKA

9. TIPU SULTAN'S PALACE, BANGALORE, DISTRICT BANGALORE.— The sunken foundation of the eastern wall of the palace was strengthened by providing masonry buttress with proper concrete base. The damaged portions of the plaster of the wall were replastered and colour washed to match with the original. The roof was watertightened. To avoid decaying of wooden members, the beams and pillars were coated with wood protector after removing the encrustations by thorough rubbing with sand paper. The wooden members were also painted with enamel painting of suitable colour to match with the original.

10. FORT, DEVANAHALLI, DISTRICT BANGALORE.— The collapsed and fallen fortification wall near the western entrance of the fort and the collapsed external veneering members of the bastion were carefully cleared and the useful materials were stacked. The work of reconstructing the wall and reveneering following the original plan and elevation is in progress.

11. KAMALA BASTI, BELGAUM, DISTRICT BELGAUM.— One of the broken beams of the stellate front *mandapa* was mended by inserting concealed mild steel I-section girder of requisite size.

12. ANANTASAYANA TEMPLE, ANANTASAYANAGUDI, DISTRICT BELLARY.— Dislodged external veneering members of the Lakshmi temple were carefully dismantled and reveneering work and providing fresh bar wire fencing around the monument are in progress. The cracked beam of the main entrance was mended and the masonry support removed. The leaning pillars of the Hanuman *mandapa* were reset to plumb.

13. EXCAVATED REMAINS, MINT ENCLOSURE, HAMPI, DISTRICT BELLARY.— The excavated remains exposed to the north of STR-I and II *(1991-92,* p. 162) were reconstructed as per the extant plan and elevation by utilising the available original members (pl. XXXVII). The disturbed and out-of-plumb walls of the rectangular structures on the north-west of the complex were reconstructed to the required height with rubbles set in mud mortar and the joints were recess pointed in lime mortar besides watertightening the top. The water carriers were reconditioned and the shallow tank on the western side of the cyclopean wall reconstructed. The area between STR-I and the northern main entrance to the Mint enclosure was levelled with alternate courses of rubble and earth to an average height of l-2m.

The southern face of the moulded basement to the west of the northern main entrance was set to plumb with the available members.

14. JAINA TEMPLE, KAMALAPURAM, DISTRICT BELLARY.—The ugly looking outer veneering of small cut stone masonry set in cement mortar on the western and eastern walls was dismantled and reconstructed by providig new dressed stone slabs matching with the original wherever necessary. The thick layer of dead concrete over the roof was removed carefully and fresh brick jelly concrete was laid to a requisite thickness as a weather proof course.

15. LOTUS MAHAL, KAMALAPURAM, DISTRICT BELLARY.— In continuation of the last year's work *(1991-92,* p. 163) the piers, roof and floors of both the storeys were provided with fresh combination mortar plaster over the rough base. The damaged portions of the *chhajja* were remodelled as per the original and missing stones were replaced with fresh ones. The *chhajjas* were also plastered with combination mortar. The newly plastered surface was suitably colour washed to match with the original. The flooring of both the floors was relaid in white cement as per the original.

16. MAHANAVAMI DIBBA, KAMALAPURAM, DISTRICT BELLARY.—The collapsed northeastern portion of the cyclopean wall on the east of the Mahanavami Dibba was carefully dismantled and reconstructed using the available stone blocks and following the original plan and elevation and the top watertightened using lime *surkhi.*

17. QUEEN'S BATH, KAMALAPURAM, DISTRICT BELLARY.— In continuation of the last year's work *(1991-92,* p. 163)., the exposed surface of the wall ceiling, pilasters and piers were replastered. The damaged water inlet was also repaired and reconditioned.

18. KRISHNA TEMPLE, KRISHNAPURAM, DISTRICT BELLARY.— The out-of-plumb and dislodged architectural members of the cloister *mandapa* on the west of northern entrance of the temple were dismantled and reconstructed as per the original utilizing the available members.

19. NARASIMHA STATUE, KRISHNAPURAM, DISTRICT BELLARY.—The numerous hair cracks and holes developed in the image and the joints were thoroughly cleaned and mended. Rough stone block provided in the left porton of the chest was remodelled and some other bulged portions were dressed. The discoloured cement patchwork of *prabhavali, kirtimukha* and the face of Narasimha was retouched and the entire monolith colour matched. The rough stones provided as supports below the folded legs were replaced with properly dressed supports. The damaged portions of the *naga* coil were mended.

20. VITTHALA TEMPLE, VENKATAPURA, DISTRICT BELLARY.— The out-of-plumb cloister *mandapa* on the west of the southern entrance of the temple which was dismantled earlier was reconstructed as per the original. A fresh weather-proof course was laid over the roof. Minor repairs to the *gopura* over the northern entrance were also attended to.

21. GALAGANATHA GROUP OF TEMPLES, AIHOLE, DISTRICT BIJAPUR.— Fallen, dislodged and out-of plumb sub-shrines and the *mandapas* adjoining the ornate *torana,* on the south-west of the Galaganatha temple were dismantled and set to plumb as per the original using the available architectural members. The sub-shrines were provided with fresh stone apron. The open courtyard on the west of the *torana* and the area between the sub shrines were paved with fresh dressed sandstone slabs.

22. JYOTIRLINGA GROUP OF TEMPLES, AIHOLE, DISTRICT BIJAPUR.— The well, on the eastern corner of the Jyotirlinga group of temple is being desilted to remove and reset the collapsed veneering stone members.

23. MALLIKARJUNA GROUP OF TEMPLES, AIHOLE, DISTRICT BIJAPUR.— The archaeological area around the temple complex was fenced by providing angle iron frames with chain link mesh over the existing dwarf wall.

24. BHUTANATHA GROUP OF TEMPLES (EAST), BADAMI, DISTRICT BIJAPUR.— The out-of-plumb entrance *mandapa* of the temple was removed and reset. The platforms on the northern and northeastern sides of the Bhutanatha temple were reset after giving proper base. Similarly, unevenly sunken pavement and steps leading to the tank on the northern and western sides were refixed after due levelling. Fresh stone flooring in the missing area is being provided and the entire flooring is being pointed with cement mortar.

25. ARGUILLA, BIJAPUR, DISTRICT BIJAPUR.— Archaeological area in the north-west portion was fenced using chainlink mesh, welded to 'L' angle frames.

26. GOL GUMBAZ, BIJAPUR, DISTRICT BIJAPUR.— The decayed and loose lime plaster over the wall and ceiling of the minarets were completely raked out. The work of replastering in combination mortar is in progress. The arches on the ground floor of the minarets were closed using welded mesh to regulate the entry of the visitors. A cattle trap was provided in the main entrance to the complex

27. HAJI HASAN SAHEB'S TOMB, BIJAPUR, DISTRICT BIJAPUR.— The missing portions of the compound wall around the monument were reconstructed in uncoursed rubble masonry set in combination mortar to enclose and safeguard the archaeological area.

28. IBRAHIM ROUZA, BIJAPUR, DISTRICT BIJAPUR.— The collapsed and fallen portion of the compound wall on the northern side was reconstructed in uncoursed rubble masonry and joints were pointed.

29. MANGOOLI GATE, BIJAPUR, DISTRICT BIJAPUR.— The collapsed portions of the fort wall and bastion on both the sides of the gate were reconstructed as per the original utilizing the old and new material. The damaged intrados of the main entrance was repointed. The openings of the adjoining rooms and arches were enclosed by providing welded mesh.

30. SIKANDAR SHAH'S TOMB, BIJAPUR, DISTRICT BIJAPUR.— The work of reconstructing the dry rubble masonry wall wherever fallen using uncoursed rubble masonry set in cement mortar and providing fresh lime plaster to the mosque adjoining the tomb was completed.

31. AMRUTESWARA TEMPLE, AMRUTAPURA, DISTRICT CHIKMAGALUR.— The decayed thick lime mortar over the roof of the temple was removed carefully and reconcreted and watertightened.

32. FORT AND TEMPLES, CHITRADURGA, DISTRICT CHITRADURGA.—The fallen portion of the fort wall near the *Kamanabagilu* gate was reconstructed as per the original plan and elevation. The unevenly sunken steps leading to the upper fort were removed and relaid as per the original after levelling.

33. MURUGHARAJENDRA MATHA, FORT, CHITRADURGA, DISTRICT CHITRADURGA.— The decayed lime concrete over the roof of the Murugharajendra *matha* is being carefully removed for suitable watertightening. The cracked beams of the *matha* are being mended with stainless steel dowels to remove the supporting props.

34. NAGARESWARA TEMPLE, BANKAPURA, DISTRICT DHARWAR.— The masonry wall provided in place of original veneered wall was dismantled and the same was reconstructed using new veneering members following the original features available in the adjacent portions of the temple.

35. JAINA TEMPLE, LAKKUNDI, DISTRICT DHARWAR.— The out-of-plumb retaining walls on the southern and western sides of the temple were dismantled and reconstructed after increasing the width at the base to support the filling.

36. HOYSALESWARA TEMPLE, HALEBID, DISTRICT HASSAN.— The concrete slabs laid over the northern entrance were dismantled carefully for resetting with original members. Some of the missing architectural members were identified from the reserve collection of the Archaeological Museum, Halebid. Chiselled and dressed architectural members, to replace the missing ones, are also being prepared. Resetting work is in progress.

37. GOMMATESVARA STATUE, SRAVANABELAGOLA, DISTRICT HASSAN.—The works of chiselling the rough and uneven flight of steps in the hillock and fixing the galvanized iron pipe-railing along the steps are in progress.

38. SOMESVARA TEMPLE, KOLAR, DISTRICT KOLAR.— The fallen and dislodged portion of the *prakara* wall on the southern side of the temple was carefully cleaned and reconstructed following the original plan and elevation, using the available original stone blocks. The brick parapet was reconstructed with old and new bricks and plastered in cement mortar.

39. LAKSHMI-NARAYANA TEMPLE, HOSAHOLALA, DISTRICT MANDYA.—Mild steel angle frames with chainlink mesh fencing were provided over the existing dwarf compound wall for protecting the garden laid in the archaeological area.

40. ANCIENT PALACE SITE, SRIRANGAPATNA, DISTRICT MANDYA.—Debris accumulated at the ancient palace site is being scientifically cleaned exposing thereby hidden structural remains. Useful materials were stacked separately for conserving the exposed structure.

41. COLONEL BAILEY'S DUNGEON, SRIRANGAPATNA, DISTRICT MANDYA.— The fallen portion of the fort wall was reconstructed using the available original materials. The damaged brick parapet wall was also reconstructed and plastered in combination mortar and suitably colour washed to match with the original. The disturbed steps leading to the Dungeon were repaired and the missing ones were replaced. Karb stones were laid along the approach pathway and specially designed iron gate was provided at the entrance of the Dungeon.

42. SRIKANTESVARA TEMPLE, NANJANGUD, DISTRICT MYSORE.— The decayed lime plaster of the outer wall behind Sivakuta shrines on the southern side was completely removed and replastered with combination mortar. The damaged wooden perforated door of Maharaja Sannidhi on the southern side was repaired by providing mild steel clamps and other fittings. The loose sculptures near the small *gopura* were enclosed with chain barricade. The open drain on the northern side near Parvati shrine was provided with P.V.C. pipe and top covered with cement plaster.

43. KESAVA TEMPLE, SOMANATHPUR, DISTRICT MYSORE.—Dwarf compound wall is being constructed to a requisite height along the periphery of the archaeological area around the temple in cut stone masonry set in cement mortar. The work of providing barbed wire fencing above the dwarf wall is in progress.

44. SOMESVARA TEMPLE, BELLIGAVI, DISTRICT SHIMOGA.—The fallen and dismantled western wall of the sanctum of the Somesvara temple was reset to plumb as per the original after strengthening the foundation. The dislodged and out-of-plumb inner and outer veneering members of the *mukha-mandapa* were carefully dismantled and the reconstruction work is in progress.

45. MUSAFIRKHANA AND HONDA, SANTABENNUR, DISTRICT SHIMOGA.— The collapsed stone architectural members of the pillared *mandapa* on northeastern side of the *honda* were carefully identified and reconstructed as per the original after strengthening the foundation. The work of levelling the area to a requisite gradient for draining out the rain water is in progress.

46. JAINA TEMPLE, UDRI, DISTRICT SHIMOGA.—The disturbed and missing portion of the veneering wall of the eastern side of the sanctum was reconstructed as per the original utilizing the available architectural members scattered in the area (pl. XXXVIII). The core was filled with rubbles set in lime mortar. The cracked roof slabs were mended properly and refixed suitably in their position.

47. FORT, JAMALABAD (NADA AND LAILA), DISTRICT SOUTH KANARA.— The heavy growth of rank vegetation on the walls of the fort and in the area leading to the top was completely cleared. As a measure of safety, fresh flight of steps is being cut on the slippery rock surface and chain railing is being provided on the bastions.

48. CHAUTER PALACE, MOODABIDRI, DISTRICT SOUTH KANARA.— Dust and other accretions accumulated on the wooden architectural members like the pillars and ceiling planks of the palace were carefully scrapped off. Wood preservative oil (Solignum) is being applied on the carved and decorated surfaces of the pillars. Similarly enamel paint is being applied to the other wooden architectural members in the verandah and corridor.

49. GOMMATESVARA STATUE, KARKALA, DISTRICT SOUTH KANARA.— The ugly looking rubble masonry wall of the inner enclosure was removed and reconstructed as per the original, using fresh laterite stones with proper coping.

50. FORT, MADHUGIRI, DISTRICT TUMKUR.— The fallen portion of the fort (in the premises of the Police Station) was carefully cleared of debris. Useful material was stacked for reuse. Reconstruction as per original plan and elevation utilizing the available original stone blocks is in progress.

51. MALLIK RIHAN'S DARGAH, SIRA, DISTRICT TUMKUR.— A new dwarf masonry wall of requisite height was raised along the periphery of the archaeological area on the eastern side. Angle iron frames with chain link mesh were fixed over this wall and barbed wire fencing was provided to enclose the area on the eastern and northwestern sides.

52. JATTAPPA NAYAKA CHANDRANATHA BASTI, BHATKAL, DISTRICT UTTARA KANNADA.— The decayed lime over the roof of the Jaina *basti* has been removed and the work of preparing fresh stone members to replace the decayed concrete beams following the other *in situ* original ones is in progress. Roof slabs of requisite size and shape are prepared for replacing the missing ones.

Bhopal Circle

MADHYA PRADESH

53. KAMALAPATI PALACE, BHOPAL, DISTRICT BHOPAL.— The rear damaged and missing balconies were restored with original size bricks and finished with lime plaster. The work is in progress.

54. GHANTAI TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.—The G.I. barbed wire fencing on angle iron posts was replaced with stone masonry dwarf wall mounted with M.S. grill to check the encroachment and improvement of the area.

55. WESTERN GROUP OF TEMPLES, KHAJURAHO, DISTRICT CHHATARPUR.— In continuation of the last year's work *(1991-92,* p.166), the east side enclosed G.I. barbed wire fencing on angle iron posts of western group of temples was replaced with stone masonry dwarf wall mounted with M.S. grill. The approach road leading to Jagdambi temple was concreted.

56. BUDDHIST CAVES, BAGH, DISTRICT DHAR.— In continuation of the last year's work *(1991-92,* p. 167), the R.C.C. pillars, beams and slabs of Cave 6 were finished with matching rock finish plaster. Construction of R.C.C. pillars in place of all the twenty-six missing rock-cut pillars were taken up in Cave 7 and the work is in progress.

The work of guniting the walls of cave and cells was also taken up and is in progress.

57. DHARAMSHALA HOSHANGSHAH, MANDU, DISTRICT DHAR.— In continuation of the last year's work *(1991-92,* p. 167), the work of replacing the old, damaged, decayed and missing flooring with fine chisel dressed Zeerabad lime stone flooring was completed.

58. GADA SHAH PALACE, MANDU, DISTRICT DHAR.— In continuation of the last year's work *(1991-92,* p. 167) the dumped *malba* was removed and the hidden structures exposed and conserved. The damaged and out-of-plumb retaining wall was conserved in plumb and alignment. The work is in progress.

59. JAMA MASJID, MANDU, DISTRICT DHAR.— In continuation of the last year's work *(1991-92,* p. 167) the damaged and missing *chhajjas* were replaced with fine chisel dressed Zeerabad lime stone. The bulged and out-of-plumb arch was opened and restored in plumb and alignment. The old damaged dry stone masonry compound wall was restored in lime cement mortar and mounted with M.S. grill to check the encroachment and improvement of the area.

60. TAVELI MAHAL, MANDU, DISTRICT DHAR.— In continuation of the last year's work *(1991-92,* p.167), the arched opening at ground floor was closed with welded wire mesh in angle iron frame with M.S. flats for display of the antiquities. The opening at basement was also provided with angle iron door shutters with welded wire mesh.

61. KOSHAK MAHAL, CHANDERI, DISTRICT GUNA.— In continuation of the last year's work {*1991-92,* p. 167), the construction of compound wall on the back of the Koshak Mahal was completed.

62. SHAHZADI-KA-RAUZA, CHANDERI, DISTRICT GUNA.— Enclosing the area with G.I. barbed wire fencing an angle iron posts, extension of flag-stone flooring and restoration of damaged and missing stone brackets and *chhajjas* of Shahzadi-ka-Rauza was taken up and is in progress.

63. GROUP OF TEMPLES, KADWAHA DISTRICT GUNA.—In continuation of the last year's work *(1991-92,* p. 167) the Talab group of temples were enclosed with stone masonry compound wall for security of temples, and to check the encroachment. The work is in progress.

64. FORT, GWALIOR, DISTRICT GWALIOR.—The flag-stone flooring of verandah of Hospital and Jail building were replaced with cement concrete flooring. The dead and decayed concrete of roof terrace of rear verandah of Hospital building was replaced with fresh lime concrete and roof made watertight. The construction of rear fort wall is in progress.

65. JAINA COLLOSI ((EK-PATHAR-KI-BAOLI), GWALIOR, DISTRICT GWALIOR.— In continuation of the last year's work *(1991-92,* p. 167) the construction of stone masonry tank for storage of water was completed.

66. JAINA COLLOSI URWAI GATE, FORT GWALIOR, DISTRICT GWALIOR.— The drain over the Jaina images was sealed to check the flow of water on images. To avoid soil cutting and improvement of the frontage, stone pitching on cement concrete base was taken up in front of the courtyard of Jaina caves and the work is in progress.

67. MANSINGH PALACE, FORT GWALIOR, DISTRICT GWALIOR.— In continuation of the last year's work *(1991-92,* p. 168), the reinforced stone work for extension of artificial rock, superimposed with cement concrete layer was finished with rock finish cement plaster.

The temporary support provided to broken stone beams of makeup room were removed after joining the broken beams and watertightening the roof. The work is in progress.

68. SAS BAHU TEMPLE, FORT GWALIOR, DISTRICT GWALIOR.— The accumulated *malba* around the platform of Bahu temple was removed and platform exposed and conserved. The G.I. barbed wire fencing on angle iron posts was replaced with stone masonry dwarf wall mounted with M.S. grill. The work is in progress.

69. TOMB OF MOHAMMAD GHAUS AND TANSEN, GWALIOR, DISTRICT GWALIOR.— In continuation of the last year's work *(1991-92,* p. 168), the maintenance of lawns and flower plants remained in progress for improvement and development of the complex.

70. TEMPLE REMAINS, BADGAON, DISTRICT JABALPUR.— In continuation of the last year's work *(1991-92,* p. 168) of enclosing of the area with G.I. barbed wire fencing on angle iron posts was completed for security of the remains and to check the encroachment in the area.

71. OLD FORT, BURHANPUR, DISTRICT KHANDWA.— The accumulated *malba* in cells of Royal complex of old fort was excavated and removed. The damaged walls and arches were repaired and

conserved. The modern structures were removed. Tanks in the Royal Hammam complex were reset to expose the original tank and water channels. The frontage of the old fort was also underpinned and repaired with original (pl. XXXIX) bricks. The work is in progress.

72. BUDDHIST ROCK-CUT CAVES, DHAMNAR, DISTRICT MANDSAUR.— The work of replacement of damaged and decayed lime concrete of roof terrace of caves with fresh lime concrete to check the seepage of rain water in caves and make caves watertight is in progress.

73. BRAHMANICAL ROCK-CUT TEMPLE, DHAMNAR, DISTRICT MANDSAUR.— Old, damaged and missing door shutter of the temple and niches were replaced with fresh angle iron door shutters with wire mesh. The entrance opening at ground floor was provided with collapsible shutters for safety and security of the temple and stone sculptures.

74. KAKANMATH TEMPLE, SUHANIA, DISTRICT MORENA.— In continuation of the last year's work *(1991-92,* p. 168) of dismantling the damaged and bulged lower *jagati* on north side and restoration of the same in plumb and alignment with available fine chisel dressed ashlar stones laid over cement concrete base, conjugated with R.R. stone masonry retaining wall in the rear side of *jagati* to retain the earth pressure is in progress.

75. ROCK-SHELTERS, BHIMBETKA, DISTRICT RAISEN.—In continuation of the last year's work *(1991 - 92,* p. 169), the reconditioning of the approach pathways by providing stone ending and laying flat boulders with cement concrete connecting Caves 4, 5,7, 8, and 15 was completed.

76. GROUP OF MONUMENTS, SANCHI, DISTRICT RAISEN.— In continuation of the last year's work *(1991 -92,p.* 169), the conservation of stupa and exposition of hidden votive stupa remained in progress. To improve the environment of the monument plants were planted. The upper and lower periphery of Stupa 2 was paved with chisel dressed stone flooring. The outer periphery and approach path was provided with stone flooring (pl. XL).

77. SIVA TEMPLE, BHOJPUR, DISTRICT RAISEN.— In continuation of the last year's work *(1991-92,* p. 169) restoration of missing facade with fine chisel dressed stones and filling of back with R.R. block stone masonry remained in progress.

78. GROUP OF MONUMENTS, SATDHARA, DISTRICT RAISEN.— Thick vegetational growth over and around the stupa and monasteries was removed. The monuments were provided with *morrum* on the approach path. The removal of debris of fallen portion of Stupa 1 was taken up for restoration which is in progress (pl. XLI).

79. BUDDHIST STUPAS, BERHAT, DISTRICT REWA.— Conservation of damaged and out-of-plumb stone stupa upto available height in plumb and alignment in dry stone masonry is in progress.

80. RAJA-RANI MAHAL, FORT DHAMONI, DISTRICT SAGAR.— In continuation of the last year's work *(1991-92,* p.169), the restoration of damaged and missing stone bracing and *chhajjas* with fresh fine chisel dressed stone bracing and *chhajjas* were completed.

81. BARADARI, FORT KHIMLASA, DISTRICT SAGAR.—Debris clearance of fallen portions of Baradari for restoration of walls and roof slab in plumb and alignment matching the original is in progress.

82. FORT, RAHATGARH, DISTRICT SAGAR.— In continuation of the last year's work *(1990-91,* p. 126), the restoration of damaged and missing roof of Badal Mahal was completed.

83. MAUJMATA TEMPLE, TERM, DISTRICT SHIVPURI.— The fallen *toran* gate was re-erected on original pedestal by drilling and inserting stainless steel rods and sealing with araldite (pl. XLII).

84. HELIODORUS PILLAR, BESNAGAR, DISTRICT VIDISHA.— In continuation of the last year's work *(1991-92,* p. 169), the construction of stone masonry compound wall on pile foundation was continued and completed.

85. ATHKHAMBA, GYARASPUR, DISTRICT VIDISHA.— In continuation of the last year's work *(1991 -92,* p.169), G.I. barbed wire fencing on stone posts was replaced with stone masonry dwarf wall with M.S. grill to check the encroachment and improvement of the area. The platform of the temple remains was also conserved.

86. MALADEVI TEMPLE, GYARASPUR, DISTRICT VIDISHA.— In continuation of the last year's work *(1991-92,* p. 169), G.I. pipe railing was provided on either side of the flight of approach steps to avoid any mishap.

87. UDAYAGIRI CAVES, UDAYAGIRI, DISTRICT VIDISHA.—To avoid soil cutting and improvement of frontage, the stone pitching on cement concrete base was taken up in front of Caves 7 to 17 and 19. The work is in progress.

88. BIJAMANDAL, VIDISHA, DISTRICT VIDISHA.— In continuation of the last year's work *(1991 -92,* p. 169), the damaged portion of lower platform of the exposed *jagati* was restored with fine chisel dressed stone blocks. Three missing carved *raths* on south-east side were restored. Repairs to bulged and out-of-plumb walls of *baoli* and desilting work was taken up and is in progress.

Bhubaneswar Circle

MADHYA PRADESH

89. PATALESWAR TEMPLE, MALHAR, DISTRICT BILASPUR.—In continuation of previous year's work *(1991-92,* p. 170), the surroundings of the temple were improved by removing the unwanted fragments of stone blocks and restoring the pavements. Nandi and Hanuman *mandapas* were also restored.

90. MAHADEVA TEMPLE, PALI, DISTRICT BILASPUR.— Extent of the existing fencing around temple was taken up as part of beautification. Two-fold grill-gates on western side was fixed and a staircase leading to temple platform provided.

91. KANTI DEUL, RATANPUR, DISTRICT BILASPUR.— The construction of the final platform over which the superstructure of the temple to be laid was completed and reconstruction of superstructure upto 5 ft in height was completed in eastern and southern sides.

92. SIVA TEMPLE, TUMAIN, DISTRICT BILASPUR.— The conservation of dilapidated and undulated superstructure of temple was taken up and the work is in progress (pl. XLIII).

93. SIVA TEMPLE, DEOBOLODA, DISTRICT DURG.— The construction of dwarf stone masonry wall around the temple was completed.

94. LAXMAN TEMPLE, SIRPUR, DISTRICT RAIPUR.— The surroundings were improved. The doors of sculpture shed and varandah grills and gates were colour washed. The beautification and other minor repairing of the complex was completed.

ORISSA

95. CHAUSATHA YOGINI TEMPLE, RANIPUR-JHARIAL, DISTRICT BOLANGIR.— Granite stone apron was provided around the circular outer wall of the temple to strengthen the foundation.

96. TEMPLE OF BHUBANESWAR-MAHADEVA, BOUDH, DISTRICT BOUDH.— The missing star-shaped basement of the temple was restored as per original with newly carved stones.

97. TEMPLES OF NILAMADHAVA AND SIDDHESWAR, GANDHARADI, DISTRICT BOUDH.—The missing and damaged flag-stones of front *mandapa* of Nilamadhava and Siddheswar temples were replaced.

98. BARABATI FORT, CUTTACK, DISTRICT CUTTACK.— The roof casting work of the newly constructed sub-circle office building was completed.

99. EXCAVATED BUDDHIST SITE, LALITAGIRI, DISTRICT CUTTACK.— Dilapidated exposed Monastery 1 was conserved (pl. XLIV). The work of restoration of brick masonry of Monastery 3 was also taken up. Verandah and flooring of the cells were relaid. The dilapidated walls were renovated (pl. XLV).

100. MOUNMENTS ON HILL-TOP, MAHENDRAGIRI, DISTRICT GAJAPATI.—Three temples on the hill-top were taken up for beautification purposes including cleaning, removal of vegetation and white washing, etc.

101. ASOKAN ROCK-EDICT, JAUGADA, DISTRICT GANJAM.— Substantial portion of the protected area around Jaugada was provided with barbed wire fencing.

102. EXCAVATED BUDDHIST STUPA AND MONASTERY, UDAYAGIRI, DISTRICT JAIPUR.— The reconstruc tion of dilapidated square stupa in front of Monastery was taken up and work upto lower level achieved (pl. XLVI). The cells of the monastery on the southern side was also taken up for veneering of brick work and repairing of dilapidated walls (pl. XLVII). The work is in progress.

103. ANCIENT ROCK-SHELTER, VIKRAMKHOL, DISTRICT JHARSUGUDA,— Construction of two walls in taping shape was constructed on the edge of the rock-shelter to divert the water.

104. LORD LINGARAJA TEMPLE, BHUBANESWAR, DISTRICT KHURDA.— Small miniature temple on the western side of complex were dismantled and conserved. The undulated floor of the platform of *dola-mandapa* was chiselled. The top of the Mangala temple and joints of the Ganesa temple were pointed and watertightened to arrest seepage of water. Approach stone paved pathway on the top terrace of

Mayur Vihar was laid. Dismantling and resetting of the *amla* of Siva temple and pointing and grouting the Parvati, Vishakha in the complex are in progress (pl. XLVIII).

105. RAJA RANI TEMPLE, BHUBANESWAR, DISTRICT KHURDA.—- A dwarf wall was constructed and existing angle iron poles were transplanted after needful remodelling in the north side.

106. SIDDHESWAR AND RAMESWAR TEMPLES, BHUBANESWAR, DISTRICT KHURDA.— The bat proof ceiling on wooden frame with durable iron net were provided on the ceilings of Siddheswar and Ramesar temples.

107. UDAYAGIRI-KHANDAGIRI CAVES, BHUBANESWAR, DISTRICT KHURDA.— The missing pillars of Ranigumpha cave at Udayagiri was reconstructed by R.C.C. as per original. The missing ceiling and beams were also restored simultaneously matching with assorted colour. The area around caves were fenced with R.C.C poles.

108. VARAHI TEMPLE, CHAURASI, DISTRICT PURL— The damaged and worn-out architectural members on the southern side outerwall of *mukha-mandapa* of the temple was taken up for repairs and is in progress.

109. LORD JAGANNATHA TEMPLE, PURI, DISTRICT PURI.— The deplastering of main *sikhara* of the Jagannatha temple was taken up and northern and western sides to a height of 4 m was exposed.

The work of cleaning and checking of *garbhagriha,* pointing and edging the ceiling of ground floor, painting of Ratnasimhasana, snow-creem painting over lime plaster inside sanctum, clearance of soot, cleaning of brass doors of the main temple, resetting of new stone blocks in roof of ground floor was carried out.

The sanctum inside the temple after falling of stone block was given proper tubular scaffoldig and test checking of cracks and voids were done. Deplastering the inner wall was undertaken. The refixing of new stones and grouting in the P.M.C. mixture for strengthening the core of the temple by Caltech and CICO, Orissa Small Scale Industries Corporation was entrusted to prepare stainless iron truss to be fitted inside sanctum, designed by I.I.T., Kharagpur for keeping the corbell on its proper position to arrest further fall. The work is in progress.

The removal of dead plaster of the exterior facade and battlement and repairing and white washing of Meghanad Prachir was taken up and completed, snow creem coating was applied all around the enclosure wall.

Three minor shrines on the western side of Jagannatha temple was also deplastered. Conservation of Khira Chora Gopinath was taken up and is in progress.

The roof of the southern side of *Kurmi beda* was restored by relaying the weather proof coat to arrest seepage. Missing battlements were also restored.

Fencing around the open space on north, west and partly on south sides around Meghanad Prachira was completed with new poles and barbad wire after removal of the encroachments.

Calcutta Circle

WEST BENGAL

110. PATPUR TEMPLE, BISHNUPUR, DISTRICT BANKURA.— The low lying area of the temple compound was properly levelled by filling of earth. The growth of wild vegetation from the entire surface were removed. The decayed lime concrete was removed from the roof top as well as in the verandah and relayed the same with new one. Laterite stone masonry was done in the *chala* roof near the staircase. The vertical cracks in the joints were stitched including repairing of the plinth portion and providing brick apron around it. An approach road to the temple was provided.

111. MADAN GOPAL TEMPLE, BISHNUPUR, DISTRICT BANKURA .—After careful removal of all the wild vegetal growths from the exterior, the porous and dead lime concrete from the roof top and at different floor levels were removed and relayed with fresh mortars. The area encroached upon was vacated and enclosed by erecting boundary wall of suitable height. All the cracks and fissures were stitched and grouted by proper strengthening of the compound wall.

112. RADHA BINOD TEMPLE, JOYDEV-KENDULY, DISTRICT BIRBHUM.— The porous and decayed lime concrete in the roof as well as in the verandah was thoroughly removed and relayed with the new one. The damaged ornamental turrets were properly repaired and restored. In order to check erosion and further decay, rear and eastern walls were repaired. The exterior and interior walls including that of *garbhagriha* were plastered after careful removal of the dead ones. The temple compound raised to a height of 50 cm to prevent an accumulation of rain water.

113. DUTCH CEMETERY, CHINSURAH, DISTRICT HOOGHLY.— After complete removal of all the wild vegetations from the Cemetery complex, bulged-out brick work in different graves and platforms were repaired and restored to retain their original characters. The damaged boundary wall was repaired and provided with the barbed-wire fencing and metal sheet gate and the graves with wooden doors. The pathways were repaired and re-laid wherever necessary.

114. MAYER GHAT, BELUR, DISTRICT HOWRAH.—With a view to restore the Holy Bathing Ghat from constant thrushing of the Ganges, the R.C.C. bore pile foundation with pile caps, pile beams, etc., within an enclosure of Sal-logs barricade was laid. The sacred bricks as removed before the said construction was laid over the concrete base with all projections and arches as per the old drawings and designs of the Holy Ghat.

115. ADINA MOSQUE, ADINA, DISTRICT MALDA.— The damaged brick arches on the western side of the central courtyard were restored as per original by pointing the joints (pl. XLIX) and reviewing the lime-terraced floor.

116. HAZARDUARI PALACE, MURSHIDABAD, DISTRICT MURSHIDABAD.— To prevent water seepage on the southern side during rainy season the rooftop was lime concreted and the parapet walls plastered.

117. TOMB AND MOSQUE OF ALI VARDI AND SIRAJ, KHOSBAG, DISTRICT MURSHIDABAD.— Lime concrete terracinng to the exterior of all the three domes was done after removal of dead and porous

mortars (pl. L). The damaged and bulged-out compound wall on the northern side was repaired and restored to its original position. The damaged wooden railing enclosing the outer verandah of the tomb of AH Vardi Khan and Siraj-ud-Daula was changed and painted.

118. TOMB AND MOSQUE OF MURSHID KULI KHAN, KATRA, DISTRICT MURSHIDABAD.— The domed cells on the northwestern side were treated with lime concrete, terracing after complete removal of the dead and porous mortars from their exteriors. Necessary brick work was done to retain the basic feature of both the minars as existing by one on the northwestern side and the other on the southwestern side (pl. LI). The missing portions of the pathway around the monument was restored and provided by 7-5 cm thick edging. The damaged portions of the barbed-wire fencing around the protected area of the monument were also repaired.

119. IMAMBARA, MURSHIDABAD, DISTRICT MURSHIDABAD.—Damaged terraced roof and worn-out beams and burgahs in a big room on the northern side and the other on the southwestern corner in the first floor were dismantled and renewed. The damaged wooden window shutters of the room on the above southwestern corner were changed and the louver type wooden screens on the western side repaired. The cracks and voids on the northeastern side were properly stitched and grouted.

Chandigarh Circle

HARYANA

120. SURAJ KUND, DISTRICT FARIDABAD.— Providing and laying stone pitching with combination mortar was taken up and is in progress.

121. BAOLI GHAU'S ALI KHAN, FARUKHNAGAR, DISTRICT GURGAON.— The work of restoration and watertightening the gate and *baoli* with R.C. C. masonry and plastering the gate was taken up and completed.

122. ANCIENT STUPA, AGROHA, DISTRICT HISSAR.—The work of underpinning, watertightening and restoration of the stupa was taken up as per the original (pl. LII).

123. BARSI GATE, HANSI, DISTRICT HISSAR.— The damaged and missing old bricks of the walls of the gate were underpinned, pointed and replaced with new ones as per the original.

124. FORT, HANSI, DISTRICT HISSAR.—The plaster of the gate was restored and the flooring of the room and main gate was lime concreted as per the original.

125. FEROZ SHAH PALACE, HISSAR, DISTRICT HISSAR.—Platform and walls of the cells were repaired by underpinning, watertightening, pointing and restoring in R. R. masonry.

The work of construction of the toilet block was also taken up and completed.

126. CANTONMENT CHURCH TOWER, KARNAL, DISTRICT KARNAL.— The wide and deep cracks in the wall and tower were repaired by stitching the cracks and watertightening as per the original. The old plaster was restored.

127. ANCIENT REMAINS, HARSH-KA-TILLA, THANESAR, DISTRICT KURUKSHETRA.— The exposed structures were watertightened after repairing the damaged ones (pl. LIV). The work is in progress.

128. SHAIKH CHILLI'S TOMB, THANESAR, DISTRICT KURUKSHETRA.— Damaged and disturbed portions of the walls of the cells were restored in *lakhauri* brick masonry (pls. LV-LVI)

129. GATEWAY OF MUGHAL SARAI, GHARAUNDA, DISTRICT PANIPAT.— The flooring of the gateway was restored with *lakhauri* bricks in lime cement mortar as per original.

130. KABULI BAGH MOSQUE, PANIPAT, DISTRICT PANIPAT.— Disturbed masonry was restored by underpinning and watertightening and the open joints were pointed.

131. IBRAHIM LODHI'S TOMB, PANIPAT, DISTRICT PANIPAT.— Flooring of the tomb was concreted. The damaged and missing brick masonry was restored and joints pointed (pl. LIII).

132. SHAH JAHAN-KI-BAOLI, MEHM, DISTRICT ROHTAK.—The pathways of the *baoli* were concreted and the disturbed and missing bricks were restored and joints pointed (pl. LVII).

PUNJAB

133. RAMBAGH GATE, AMRITSAR, DISTRICT AMRITSAR.— Moulded and carved floral designed red sandstone members of the lintel, brackets and veneering stones were taken up for fixing. The work is in progress.

134. DAKHNI SARAI, DAKHNI, DISTRICT JALANDHAR.— Providing and laying lime concrete on the terrace of the western gate was completed.

135. MOHAMMAD MOMIN AND HAJI JAMAL'S TOMB, NAKODAR, DISTRICT JALANDHAR.— 15 cm thick cement concrete apron was provided. The joints of drain and top of the wall were pointed (pl. LVIII).

136. NURMAHAL SARAI, NURMAHAL, DISTRICT JALANDHAR.— The work of restoration of the cells were taken up and completed. 15 cm thick cement concrete flooring was laid.

Delhi Circle

DELHI

137. JAMI MASJID, DELHI.— In continuation of last year's work *(1991-92,* p. 174) decayed and worn out red sandstone flooring provided strictly in conformity with the original pattern.

138. RED FORT, DELHI.— In continuation of last year's work *(1991-92,* p. 174), exterior walls of the Moti Masjid were plastered with composite mortar laminated with *chunam* plaster in consonance with the original pattern as per evidences available at site (pl. LIX).

Old and decayed plaster of the *hammam* was dismantled and a fresh coat of plaster with composite mortar laminated with *chumam* applied as per original.

Damaged roof was dismantled and restored in consonance with the original.

Pietradura work of the Diwan-i-Khas was carried out as per the original pattern.

139. ALAI DARWAZA, NEW DELHI.— The bulged-out red sandstone facade was dismantled and core masonry stabilized after pointing the joints with composite mortar and simultaneously red sandstones fixed in consonance with the original pattern.

140. ARAB-KI-SARAI, NEW DELHI.— Extensive structural repairs which involved rubble stone masonry, pointing and plastering with composite mortar were carried out following the original pattern.

141. BEGAMPURI MASJID, NEW DELHI.— Disturbed ashlar stone flooring was dismantled and refixed following the evidences available at site. Underpinning of stone masonry, pointing and plastering were also carried out in accordance with the original pattern.

142. JANTAR MANTAR, NEW DELHI.— Old and dead plaster was removed and a coat of plaster with composite mortar applied similar to the original pattern. Coats of water proofing cement paint were also applied on all the astronomical instruments to keep the same in a presentable condition.

143. MADHI MASJID, NEW DELHI.— Extensive structural repairs by way of underpinning of rubble stone masonry, pointing and plastering with composite mortar and laying lime cement concrete were carried out in accordance with the original pattern (pl. LX).

144. MOTH-KI-MASJID, NEW DELHI.— Disturbed ashlar stone flooring was dismantled and fixed properly in accordance with the original pattern. Underpinning of coursed rubble masonry, pointing and plastering with composite mortar were also carried out in consonance with the original pattern.

145. MUNDA GUMBAD, R.K. PURAM, NEW DELHI.—Major structural repairs which include random rubble masonry, pointing, plastering and laying lime cement concrete flooring were carried out following the original pattern.

146. QUTB MINAR, NEW DELHI.— In continuation of last year's work *(1991-92,* p. 174), structural repair to Qutb Minar at ground storey was resumed by attending replacement of crushed and damaged stone veneers including replacement of copper clamps were executed.

147. QUWWATU'L ISLAM MASJID, NEW DELHI.— Bulged masory wall, coursed rubble masonry and pointing with composite mortar in conformity with the original pattern was taken up for repairs.

148. SARAI SHAHJI, MALVIYA NAGAR, NEW DELHI.— Most of the vulnerable points are plugged by way of underpinning of coursed rubble masonry. Joints of the masonry were pointed with composite mortar to avoid seepage of water.

149. TALAQI-DARWAZA, PURANA QILA, NEW DELHI.— Structural repairs by way of coursed rubble masonry, laying lime cement concrete flooring, stitching of cracks, pointing and plastering with composite mortar were carried out in conformity with the original pattern.

150. TUGHLAQABAD FORT, NEW DELHI.—Dilapidated walls inside the fort were repaired following the original pattern by way of resetting of disturbed and bulged stone masonry, underpinning and stabilizing all loose masonry and watertightening.

Guwahati Circle

ARUNACHAL PRADESH

151. TAWANG MONASTERY, TAWANG, DISTRICT TAWANG.— In continuation of the previous year's work *(1991-92,* p. 175), walls of the store building were restored upto the second floor. Door and window frames with traditional designs wherever necessary were provided.

ASSAM

152. CACHARI RUINS, KHASPUR, DISTRICT CACHAR.— Cracks in the masonry were filled and loose bricks were reset. Pointing work to the walls attended.

153. SHRI SHRI SURJYAPAHAR RUINS, DISTRICT GOALPARA.—The approach road leading to the Jaina rock-cut panel was improved by levelling and dressing. Concrete steps were provided and flooring in front of the panel laid.

154. SIBDOL, NEGHERITTING, DISTRICT GOLAGHAT.— The remaining work of removal of decayed plaster, grouting and replastering was completed.

155. BISHNUDOL, JOYSAGAR, DISTRICT SIBSAGAR.— Replastering of the outer surface and pointing to the inner surface of the tower of the main temple was attended to. The vaulted roof of sub-shrines on the east was repaired by attending missing brick work and replacement of decayed lime concrete. Decayed plaster of the walls were removed and replastered. The floor of the *mukha-mandapa* was exposed and reset by laying two layers of special size bricks in composite mortar.

156. KARENGGHAR, JOYSAGAR, DISTRICT SIBSAGAR.— The repair to the open floor on the north-south was attended to by providing brick work at missing portions and replacing decayed lime concrete. The damaged and decayed plaster in the cellas was restored.

157. SIBDOL., SIBSAGAR, DISTRICT SIBSAGAR.— The restoration work to the damaged portions of ancient compound walls on the western side of the temple was attended.

MEGHALYA

158. SCOTT'S MONUMENT, CHERRAPUNJI, DISTRICT KHASI AND JAYANTIA HILLS.— Scott's memorial is cleaned of moss-lichen and black patches and necessary pointing work was attended.

MANIPUR

159. TEMPLE OF VISHNU, BISHNUPUR, DISTRICT BISHNUPUR.— Vegetation growth from the temple compound was cleared and surface of temple cleaned by removing moss-lichen and black patches.

NAGALAND

160. REMAINS OF FORT, DIMAPUR, DISTRICT KOHIMA.— Stone monoliths, compound wall and ancient tank were cleaned of vegetation and weeds growth.

TRIPURA

161. SCULPTURES AND ROCK-CUT RELIEF OF UNAKOTI TIRTHA, NORTH TRIPURA.— Cracks in the rock-cut sculptures were grouted and filled with composite mortar. Brick steps were provided in the pathways.

Hyderabad Circle

ANDHRA PRADESH

162. SRI VEERABHADRA TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.— Removal and resetting of the disturbed stone platform and flooring of the *Uyyala-mandapa (swing-mandapa)* were attended. A

barricade around the inscription engraved on the out-crop of the rock in the temple premises was provided to prevent it from defacing by the visitors. A wooden stair-case was provided to *kalyana mandapa*.

163. PENUKONDA FORT, PENUKONDA, DISTRICT ANANTAPUR.— Reconstruction of fallen wall of northern gateway near Anjaneyaswamy temple was taken up and fencing materials procured to barricade the archaeological area around stepped-well and other structures to prevent encroachments. The lime coat over the stone beams and lintels of Sri Anjaneya temple was removed to expose the original stone surface.

Fallen debris of the fort wall and the bastion was cleaned. Conservation of the dilapidated bastion is being taken up.

164. SRI CHINTALARAYASWAMY TEMPLE, TADIPATRI, DISTRICT ANANTAPUR.— The work of resetting of basal mouldings, pillars, capital beams and *chhajjas* of the dismantled *kalyana-mandapa* in conformity with the original was completed and preparation of new stone beams, slabs, carved *chhajjas* including dressing for fixing in the place of missed ones is in progress.

165. SRI RAMALINGESWARASWAMY (RAMESWARA SWAMY) TEMPLE, TADIPATRI, DISTRICT ANANTAPUR.— Modern accretions abutting the southern *gopura* inside the temple premises were removed with a view to expose the basal mouldings of the stone *adhishthana*. Underpinning the cracks of the first *tola* of the southern *gopura,* grouting the cracks of the brick and stone masonry and watertightening the top in brick jelly concrete including plastering were completed. The decayed wooden rafters were removed and replaced with new ones.

166. CHANDRAGIRI FORT, CHANDRAGIRI, DISTRICT CHITTOOR.— Restoration of missing balconies of Rajah Mahal were attended to matching with the original ones. Sloped *chhajja* was repaired by providing missing stone rafters of the first and second floors and watertightened (pl. LXI).

167. SRI PARASURAMESWARA SWAMY TEMPLE, GUDIMALLAM, DISTRICT CHITTOOR.— Construction of fallen breaches of compound wall with brick masonry in clay and plastering was completed. Removal of dead lime plaster over the roof of the main temple is in progress.

168. GURRAMKONDA FORT, GURRAMKONDA, DISTRICT CHITTOOR.— Plastering with combination mortar for sloped *chhajjas* in front and rear side of Rangin Mahal was completed and brick jelly concrete over the roof relaid after removal of the dead lime concrete to arrest percolation of rain water.

169. SRI SAUMYANADHA SWAMY TEMPLE, NANDALUR, DISTRICT CUDDAPAH.— Fallen veneering stones of the wall were removed and stacked properly. The bulged portion of the *prakara* wall was dismantled and the work of reconstruction of the same by using cut stone available at the site as well as new ones including filling the core with brick in CLM is in progress.

170. SIDDHOUT FORT, SIDDHAVATTAM, DISTRICT CUDDAPAH.—The dilapidated parapet wall in R.R. masonry in mud mortar on either side over the moat near the main gateway of the fort was reconstructed. Stone pitching was also provided along the fort wall over the first cloister *mandapa* entrance.

171. BUDDHIST REMAINS, ADURRU, DISTRICT EAST GODAVARI.— The debris around the excavated brick stupa was cleared carefully and the remains of brick structures exposed. The damaged barbed-wire fencing around the stupa was repaired wherever necessary.

172. SHRI BHIMESWARA SWAMY TEMPLE, DRAKSHARAMA, DISTRICT EAST GODAVARI.— The decayed and peeled off lime plaster over the southern *gopura* was removed and replastered and top finished with sacrificial coat after attending underpinning the brick masonry.

173. RECONSTRUCTED MONUMENTS, NAGARJUNAKONDA (ANUPU), DISTRICT GUNTUR.—The sides and top of the brick structures were watertightened after raking out the joints and recess pointing.

174. GOLKONDA FORT, GOLKONDA, DISTRICT HYDERABAD.—Thick vegetational growth, accumulated debris and decayed lime concrete over the roof of African Body guard rooms removed and fresh lime concrete bed laid to arrest percolation of water from the top. The decayed lime concrete floor was removed and relaid matching the original. Iron grills with G.I. diamond mesh was provided around the structures with a small gate to prevent encroachments and misuse (pl. LXII).

Removal of the peeled off plaster over the vaulted hall of Rani Mahal and replastering the same as per the original including the miniature niches with stucco work were attended to and completed.

175. BANDAR FORT, MACHILIPATNAM, DISTRICT KRISHNA.—Thick growth of vegetation and fallen debris in Armoury Hall inside the fort were cleared and brick masonry pillars abutting the existing walls to support the roof and buttresses from the exterior to support the leaning wall were provided, besides watertightening the roof by laying baked flat-tiles. Damaged doors, windows and ventilators were repaired wherever necessary.

176. AKKANNA MADANNA CAVES AT VIJAYAWADA, DISTRICT KRISHNA.— The thick deposit of fallen debris from the hill top mixed with stone boulders and vegetational growth were cleared from the top of the upper cave. The exposed crevices were grouted in different grades of cement concrete to arrest the leakage. The area around the cave was also cleared and made presentable.

177. SRI UMAMAHESWARA SWAMY TEMPLE, YAGANTI, DISTRICT KURNOOL.— Debris of earth mixed boulders accumulated due to heavy rains was cleared and approach pathway provided from roadside upto the flight of steps leading to *Pushkarini-mandapa.* Damaged stone pavement around the *Pushkarini* was attended to by providing new stone slabs wherever found missing and pointed, The damaged portion *of the prakara* wall on the northern side was attended to by resetting the fallen stones and finally filling the core with small stones mixed with hydrated lime mortar. Repairs by filling the cracks and underpinning in *Agastya-mandapa* were carried out. The fallen wall on the side of the *Agastya-mandapa* was reconstructed.

178. NAVA BRAHMA GROUP OF TEMPLES, ALAMPUR, DISTRICT MAHABOOBNAGAR.— The dead lime plaster and lime concrete from the roof of the *mandapa* and parapet wall of the Bala Brahmeswara Swamy temple were removed and replastered. Outer surface of the stone *sikhara* over the *garbhagriha* was recess pointed in cement mortar neatly to arrest the leakage. The *taki* stone parapet wall in mud mortar over the roof of Arka Brahma was plastered.

179. CHOLA TEMPLE, MOTUPALLI, DISTRICT PRAKASAM.— The roofs of the main shrine and *mukha mandapa* were provided with fresh baby jelly concrete after removal of the decayed one. The cracks on the exterior wall of the main shrine were filled with cement mortar.

180. BUDDHISTREMAINS, SALIHUNDAM, DISTRICT SRIKAKULAM.—The damaged and dislodged stupa with stone veneering on the upper terrace of the hillock was dismantled after thorough photo and drawing documentation and rebuilt in its original shape and dimension by strengthening the core inside. The top layers of the other brick structures like votive stupas, *chaityas* and *viharas* were also strengthened in CLM and top watertightened. The structures in the lower terrace of the hillock, *viz.,* high brick walls, cells, *viharas* which were badly affected by the cyclone were strengthened by way of underpinning after removing the pulvarized and decayed bricks and top watertightened.

181. THOUSAND PILLARED TEMPLE, HANAMAKONDA, DISTRICT WARANGAL.— The newly concreted roof of Trikuteswara temple was further provided with machine press tiles.

182. RAMAPPA TEMPLE COMPLEX, PALAMPET, DISTRICT WARANGAL.— Watertightening the roof of the reconstructed *mukha-mandapa* of Sri Kateswaralaya temple by way of the filling the joints of the stone slabs with baby-jelly concrete and providing brick-jelly concrete over the roof was completed.

KARNATAKA

183. AHMAD SHAH WALI BAHAMANI'S TOMB, ASHTOOR, DISTRICT BIDAR.— Thick vegetational growth and accumulation of fallen debris over the roof in-between the parapet and drum of the dome were cleared to watertighten the leaky dome with a view to save precious paintings on the interior walls and ceiling. The retaining wall of the platform in front of the tomb was constructed in C.R. masonry.

Jaipur Circle

RAJASTHAN

184. MARBLE PAVILIONS AND BALUSTRADE AND THE MARBLE HAMMAM, ANASAGAR BANDH, AJMER, DISTRICT AJMER.— Restoration of the collapsed arches, lintels and brackets of the fallen Khan-m-Khan gateway was completed as per original.

Dismantling of old decayed plaster of the retaining wall of Anasagar and replastering the same is in progress. Dismantling of loose decayed concrete of the platform and relaying the fresh concrete was also taken up.

185. BAZAR, BHANGARH, DISTRICT ALWAR.— Exposing the buried shops on north (31-50) and south side bazar (1-20) was taken up and is in progress. The repair of the exposed shops by way of underpinning the R.R. masonry walls, sunk pointing the open joints of the masonry and relaying of lime cement concrete floors after dismantling the old decayed concrete was also taken up.

186. KESHAVA RAI TEMPLE, BHANGARH, DISTRICT ALWAR.—Restoration of the fallen enclosure wall and structure annexed to the temple by R.R. masonry and sunk pointing of the joints was done. Decayed stone flooring in the courtyard around the temple was dismantled and provided with cement concrete bed.

187. MANGLA DEVI TEMPLE, BHANGARH, DISTRICT ALWAR.— Laying of R.R. stone masonry flooring around the temple and sunk pointing of the same and open joints of the stone *sikhara* is in progress.

188. NORTH WALL AND CELL HANUMANA GATE, BHANGARH, DISTRICT ALWAR.— Reconstruction of the R.R. masonry of the fallen wall on north near Hanumana gate was completed.

Restoration of the fallen cell on north of the Hanumana gate by R.R. masonry, sunk pointing of open joints, relaying the roof of the cell and lime cement plastering of the arched ceiling of the cell was completed.

189. FORTIFICATION WALL, BHANGARH, DISTRICT ALWAR.— Southern fortification wall upto second bastion was exposed. Partial restoration of the fallen portions by R.R. masonry, sunk pointing of the open joints in the repaired wall was also done for the purpose of watertightening.

190. BAOLI ADJACENT TO MUD-TOR-KI-DEORI, NEELKANTHA, DISTRICT ALWAR.— Loose and bulged R.R. masonry wall on the east was exposed and dismantled and reconstructed. Resetting the dismantled stone steps as per original was attended and sunk pointed. Coping was provided on the top of the walls of *baoli* by laying lime cement concrete.

191. FORT, BHARATPUR, DISTRICT BHARATPUR.—Repairing of the breached fort wall on Gopalgarh side by R.R. masonry and underpinning the fallen/missing patches of the masonry was continued.

192. SAVAN BHAWAN, DIG, DISTRICT BHARATPUR.— In continuation of the previous year's work *(1991-92,* p. 178), dismantling and restoration of the remaining half portion on eastern side of the damaged roof of Savan Bhawan by providing R.S. joist, wooden beams, battens and planks and laying of brick-tile *kharanja* in lime cement mortar was completed as per original (pl. LXIII).

193. DIG PALACE, DIG, DISTRICT BHARATPUR.— Repair of the copper pipe of the fountain and relaying of the lime cement concrete in the beds of fountains in the *chaupar* to prevent leakage was completed. Replastering the outer face of the northern side wall of the overhead tank inside the palace was also taken up and is in progress.

194. KACHCHA BAGH, DIG, DISTRICT BHARATPUR.— Dismantling of the bulged and decayed western side compound wall, excavation of the foundation, laying of cement concrete in the foundation and reconstruction of the wall was completed.

195. FORT, CHITTAURGARH, DISTRICT CHITTAURGARH.— Replacement of the broken beam, lintel and roof stone slab, laying of lime cement concrete on the roof and R.R. masonry parapet on the roof of the *antarala* of small Siva temple near Ratan Singh Palace inside the fort was completed.

196. BHATNER FORT, HANUMANGARH, DISTRICT GANGANAGAR.— Damaged pathway inside the fort was dismantled and relaid in lime cement concrete with brick ballast. The work of underpinning the decayed and missing portion of special type and size brick masonry fortwall and bastions with lime cement mortar mixed with brick *zeera* was also taken up and is in progress (pl. LXIV).

197. LAXMI-NARAIN TEMPLE, AMBER, DISTRICT JAIPUR.—Dismantling of the decayed portion of the flooring of the temple courtyard and relaying with new stones of matching colour and texture is in progress.

198. JAGAT SHIROMANI TEMPLE, AMBER, DISTRICT JAIPUR.— Dismantling the loose plaster of the walls of the courtyard, replastering the same and replacing the decayed wooden doors of the courtyard were taken up and completed.

199. FORT, JAISALMER, DISTRICT JAISALMER.— Bulged-out and damaged lower fortification wall was dismantled, and reconstruction of the wall in R.R. masonry and resetting of fallen ashlar stone masonry is in progress.

200. FORT, KUMBHALGARH, DISTRICT RAJSAMAND.— The fallen fortification near Dani Batta gate was restored in R.R. masonry as per original.

Removing and resetting the loose stones of the *sikhara* of Bawan Deori in lime mortar and cutting chases in the broken stone lintels of the corridors for providing the concealed girders was completed. Removal of the loose mortar and raking out of the joints of stone courtyard and repointing the same is in progress.

Clearance of fallen debris of the collapsed *sabha-mandapa* of Golerao Temple 2 is in progress.

201. FORT, RANTHAMBHOR, DISTRICT SAWAI MADHOPUR.—Earth-work excavation and construction of R.R. masonry pathway from Battis Khamba Chhatri to Padam Talab was taken up and completed.

The dismantled *malba* of roof concrete of Hamir Bari Kacheri was cleared off and relaid in lime cement concrete. The dismantled floor of the *kacheri* was also relaid in lime cement concrete. Providing R.R. masonry retaining wall and parapet to retain the soil, earth-work filling in front of the *kacheri* and levelling the area was also completed.

Lucknow Circle

UTTAR PRADESH

202. KHUSROBAGH, ALLAHABAD, DISTRICT ALLAHABAD.— The rubble stone masonry compound wall on southern side was restored by resetting the stone masonry and pointing the joints. The work is in progress.

The stone flooring of the tomb of Sultan Khusro was provided after resetting and pointing. The pathway along the tomb of Khusro's mother was repaired.

203. KYDGANJ CEMETERY, ALLAHABAD, DISTRICT ALLAHABAD.— The graves of the cemetery were repaired after stitching the cracks and plastering with lime cement mortar. Clearance and levelling work was also taken up and is in progress.

204. FORT, KALINJAR, DISTRICT BANDA.— In continuation of previous year's work *(1991-92,* p. 179), flooring near the Neelkantha temple was concreted. The stone masonry wall was reset and recessed pointed. An iron pipe railing was also provided to regulate the visitors. The work is in progress.

205. BADSHAHI BAGH, KHAJUA, DISTRICT FATEHPUR.— The dislodged *lakhauri* brick masonry compound wall on north side is being reset and the joints are being pointed. The work is in progress.

206. KATCHERY CEMETERY, KANPUR. DISTRICT KANPUR.—In continuation of previous year's *(1991 - 92,* p. 179) work, the Katchery cemetery was lime concreted to facilitate the movement of the visitors.

207. SURANG TEMPLE, DUDHAI, DISTRICT LALITPUR.— In continuation of previous year's *(1991-92,* p. 179) work, the vegetation, debris, etc., were removed and coarse rubble stone flooring provided.

208. TALBEHAT FORT, TALBEHAT, DISTRICT LALITPUR.— The collapsed wall of Talbehat fort on the southern side was taken up for reconstruction. The work is in progress.

209. ASAFI MOSQUE, LUCKNOW, DISTRICT LUCKNOW.—In continuation of previous year's *(1991-92,* p. 180) work of concreting southern side of the dome was completed. Part of southern side roof terrace was reconcreted after removing decayed plaster. The miniature domes towards eastern side parapet having carvings were also restored.

210. ASAF-UD-DAULA'S IMAMBARA, LUCKNOW, DISTRICT LUCKNOW.— After carefully removing peeled off and decayed plaster towards eastern wing of the forecourt facing south in the ground floor and partly in the second floor, fresh plaster was reproduced in conformity with the original. In order to check dampness, a lime concrete apron was provided along eastern and southeastern wing.

The fallen *Chhajja* of western wing of the southern facade, second forecourt, adjoining second gateway facing south was restored after providing cantiliver arched support beneath it. The missing lime plaster having rich mouldings was reproduced. The colour matching of three passages in second gateway was attempted as per original shade.

The upper main chamber of *baoli* alongwith three large rooms in the southern and back side galleries were replastered in lime mortar. The floors of four large rooms alongwith back side passages was lime concreted.

211. DILKUSHA PALACE, LUCKNOW, DISTRICT LUCKNOW.— The staircases of the main building facing east were exposed by removing the debris. The steps and side walls were repaired by *lakhauri* brick work and lime plastered. Top courses of the high existing walls of the palace were underpinned, stitched and strengthened and pointed.

212. KAZMAIN BUILDING, LUCKNOW, DISTRICT LUCKNOW.— The decayed plaster of northwestern wing was removed and replastered. All the floors of northern wing and roof terrace of middle, in-between middle and east side gateway was reconcreted with lime mortar and brick ballast. Richly carved lime plaster in stucco of the front facade of middle gateway was reproduced matching with the original.

213. MUSHIRZADI'S TOMB, LUCKNOW, DISTRICT LUCKNOW.— The ceilings of the tomb which were in dilapidated condition were restored by way of underpinning, grouting and plastering after removing the decayed plaster. Pillars, wall panels and miniature domes were reproduced by *lakhauri* brick work and rich moulded lime plaster. Lime concrete flooring was provided on the terrace of the second floor.

214. RESIDENCY BUILDINGS, LUCKNOW, DISTRICT LUCKNOW.— In continuation of previous year's work *(1991-92,* p. 180), the remaining work of pointing the joints was taken up at Treasury building to strengthen the structure. Besides, flooring was concreted and other repair works were undertaken. The ruined structures of Bada Khandahar was underpinned and pointed.

215. SAADAT ALI KHAN'S TOMB, LUCKNOW, DISTRICT LUCKNOW.— The miniature domes, minarets, *chhajjas,* pillars and the ceiling of the halls on the north, south, east and west were repaired with moulded *lakhauri* bricks and lime plastered. Cracks were filled up and pointed. Eight minarets were reproduced on the four sides of the monument in moulded *lakhauri* brick work and by attempting rich carved designs in stucco in conformity with the original.

216. SIKANDER BAGH GATE, LUCKNOW, DISTRICT LUCKNOW.— The northeastern enclosure wall of the Sikander Bagh was repaired by underpinning and restoring the *chhajjas,* cornices, etc., in conformity with the original. The walls were lime plastered and richly carved mouldings wherever missing were reproduced.

217. KEERAT SAGAR LAKE, DISTRICT MAHOBA.— The stone masonry stairs of the Zananaghat and Badaghat were repaired by pointing the joints.

218. CAVE, MAHOBA, DISTRICT MAHOBA.— An iron gate was provided to the Cave of 24 Tirthankaras in order to ensure safety and security of the monument.

Madras Circle

KERALA

219. FORT ST. ANGELO, KANNUR, DISTRICT KANNUR.— The reconstruction as per original of the fallen portion of the western fortification is under progress.

220. BEKAL FORT, PALLIKERE, DISTRICT KASARGOD.— The reconstruction of the fallen eastern rampart as per original is completed. The original water outlet was traced and conserved properly.

221. SIVA TEMPLE, NETRIMANGALAM, DISTRICT PALAKKAD. — The roofs of the main and the sub-shrines were rendered watertight by providing a new weathering course after removing the old and dead one. A stone apron was provided around the main shrine.

PONDICHERRY

222. SVAYAMBHUNATHASVAMI TEMPLE, NEDUNGADU, PONDICHERRY.—The moss and lichen infested over the *sikharas* of the main *Amman,* Ganesa, and Subrahmanya shrines were removed. The brick masonry *sikharas* were watertightened. The stucco figures were strengthened by mending them first with combination mortar and then applying two coats of fine lime plaster over it and matching with the original in form. Suitable colourwash was provided.

TAMIL NADU

223. KAILASANATHA TEMPLE, KANCHIPURAM DISTRICT CHENGALPATTU-M.G.R.— The wide joints, formed due to the weathering of the poor quality sandstone, over the *deva-kulikas* were completely

raked out and recess pointed in combination mortar, matching the texture of the original sandstone members.

224. DUTCH FORT AND CEMETERY, SADRAS, DISTRICT CHENGALPATTU-M.G.R.— In continuation of the last year's work *(1991-92,* p. 181), the northeastern corner of the fortification was taken up for conservation. There were huge voids in the fortification and huge chunks of masonry were preserved *in situ.* Such was the result of heavy shelling in the ancient wars and the neglect thereafter. The voids were closed in matching masonry using bricks of the size of the original, set in combination mortar. However, the original portions of the fortification were preserved *in situ* wherever possible. In addition, the huge chunks of the original fortification obtained *in situ* were also used in the reconstruction.

225. TIRUPULISVARA TEMPLE, VAYALUR, DISTRICT CHENGALPATTU-M.G.R.— In continuation of last year's work *(1991 -92,* p. 181), the *vasanta-mandapa* located to the north-east of the complex, which was *in* dilapidated condition due to dislodgement of the architectural members from their position and due to breakage (pl. LXV) was taken up for conservation. The entire structure was dismantled after due documentation of the intact portion. After providing a suitable foundation, the *vasanta-mandapa* was reconstructed as per the original, which also included the reconstruction of the missing portion of the northern *prakara* as the *vasanta-mandapa* abuts the same. In the process of reconstruction available old suitable stones were utilized in place of missing architectural members. Some of the broken beams were mended using I-section girders and broken pillars were replaced.

226. CHENNARAYAPERUMAL TEMPLE, ADIYAMANKOTTAI, DISTRICT DHARMAPURI.— The *sikharas* of the main and Garuda shrines were watertightened after raking out the decayed plaster and replastering the same with combination mortar. Suitable colouring was given.

227. ST. GEORGE'S GATE, FORT ST. GEORGE, MADRAS, DISTRICT MADRAS.— The fallen rampart on the western side of the St. George's gate was reconstructed as per the original. The roof of the gate was rendered watertight by laying a new course of lime *surki* after removing the old course.

228. FORT, VELLORE, DISTRICT NORTH ARCOT-AMBEDKAR.—The archaeological area to the north east of the fort was fenced with iron-grill over a toe wall. A barbed-wire fencing was provided on the northern side.

229. OLD COLLECTOR OFFICE BUILDING, FORT, VELLORE, DISTRICT NORTH ARCOT-AMBEDKAR.— In order to organize a site museum, the hall in the ground floor was paved with Shahabad stones. Brick masonry pedestals were built on which the sculptures were mounted. Replastering was done to the exterior of the building.

230. SUGRIVESVARA TEMPLE, SIRCARPERIYAPALAYAM, DISTRICT PERIYAR.— In order to bring the out-of-plumb walls of the *ardha-mandapa* and that of the *mukha-mandapa* to plumb, the entire structure was dismantled after proper documentation and the same was reconstructed *upto pada* level as per the original. The work is in progress.

231. JAINA TEMPLE, METTUPUDUR, DISTRICT PERIYAR.— The accretionary coat of plaster, applied over the *gopura* of the *maha-dvara* by the P.W.D. in the past, was removed to expose the original

features. Further, the *gopura* was made watertight by replastering it with a layer of fine ground lime after mortar consolidation and mending the stucco figures as per original.

232. TIRUVILANGUDY SIVA TEMPLE, SURIYUR, DISTRICT PUDUKKOTTAI.— Whole temple-complex was in dilapidated condition due to stagnation of flood water from the nearby tank and utter negligence. The foundation of all the structures had disturbed, the core had disintegrated, some portions of the structures had fallen and standing portions had either bulged or out-of-plumb. Therefore, after careful documentation of all the structures as well as identifying and proper stacking of all the fallen architectural members, the whole area was cleared of debris, sectioned and provided with drainage. Then the main temple was dismantled completely. The temple is reconstructed with the available original architectural members upto *prastara* level, after providing strong suitable foundation in concrete. The core of the walls is filled with cement concrete. The work is in progress (pl. LXVI).

233. SIVA TEMPLE, THODAIYUR, DISTRICT PUDUKKOTTAI.—In continuation of last year's work (7997-*92,* p. 183), the *Amman* shrine, *maha-dvara* and the *prakara,* all exposed in the last year's earthwork, were taken up for consolidation and reconstruction. The remains were dismantled after documentation. They were reconstructed to the possible height with available architectural members after providing a suitable foundation. A stone apron was provided around the main shrine to prevent the rain-water from seeping into the foundation. As the original working level of the whole complex is below the present day ground level, a low revetment wall was constructed on the east and south.

234. PALACE STRUCTURE, ROYAL ENCLOSURE, FORT, GINGEE, DISTRICT SOUTH ARCOT.— The eastern wall of the palace structure located within the Royal Enclosure at the foot-hill of Rajagiri was dismantled and reconstructed as per the original to the available height. In the process, the spiral staircase built within the core was reset as per the original. The core was filled with rubbles in cement mortar. The flooring of the first landing was reconditioned.

235. VENKATARAMANA TEMPLE, GINGEE, DISTRICT SOUTH ARCOT.— The decayed/missing wooden beams provided to the *nasika* openings of the *talas* of the *gopura* were replaced with R.C.C. beams with matching wooden finish. The *gopura's* interior was rendered watertight by closing the voids with matching brick masonry. The brick masonry portion of the inner cloister wall on the east was dismantled and a new brick wall was constructed using the bricks of the same size.

236. PATTABHIRAMA TEMPLE, NARASINGARAYANPETTAI, DISTRICT SOUTH ARCOT.— The voids in the brick *gopura* of the *maha-dvara* was filled in matching brick masonry. The *brahmarantara* of the *gopura* which was damaged due to thunderstorm was reconstructed and rendered watertight by replastering in combination mortar with a fine ground lime plaster applied over it.

237. TALAGRIVESVARA TEMPLE, PANAMALAI, DISTRICT SOUTH ARCOT.—The moss and lichen growth over the *talas* were removed, the brick masonry *sikhara* was consolidated and rendered watertight by replastering it. The joints of the *talas* were pointed. The damaged stucco figures were mended and strengthened properly.

238. NITISVARASVAMI TEMPLE, SRIMUSHNAM, DISTRICT SOUTH ARCOT.— The all-brick structure of the Haripurisvara shrine located within the complex was found in a dilapidated state as the lime mortar had lost its binding strength and due to percolation of water. Besides, the structure had been reconstructed several times in the past using sub-standard bricks resulting in poor masonry. The structure was documented properly and then dismantled brick by brick. The same was reconstructed upto *prastara* level as per original over a new foundation and inter-mixing the old and new bricks of the same size. The work is in progress. The *arddha-mandapa* of the *Amman* shrine was given a new weathering course.

239. BRIHADISVARA TEMPLE, GANGAIKONDACHOLAPURAM, DISTRICT TIRUCHCHIRAPALLI.— In continuation of last year's work *(1991-92,* p. 184), the northern portion of the *maha-dvara* was reconstructed as per original (pl. LXVII). Earthwork was done in front of the *maha-dvara* to expose the original working level and buried structural remains leading to the discovery of plinths of two sub-shrines on either side of the *maha-dvara* which are in all possibility meant for accomodating Ganesa and Shanmukha. The shrines were reset to plumb for available height.

240. SIVA TEMPLE, VALIKANDAPURAM, DISTRICT TIRUCHCHIRAPALLI.— In continuation of last year's work *(1991 -92,* p. 184), repairs to inner side of the *gopura* was taken up. The dead plaster was removed and replastered. The worn-out brick masonry on the *talas* were redone with bricks of the same size. The cracks formed in the *tola* openings were mended using stainless steel dowels. The *maha-nasika* was replastered as per original. Flooring in the first and second *talas* was reconditioned. Missing wooden members were replaced with new ones.

241. BAKTAVATSALA TEMPLE, CHERANMADEVI, DISTRICT TIRUNELVELI-KATTABOMMAN.— The brick masonry *sihara* was consolidated and watertightened.

Mini Circle, Goa

GOA

242. FORT, AGUADA, GOA.— A part of the fallen wall (measuring 15 m long and 9 m high) was taken up for repairs. The whole breached portion of the wall was reconstructed with laterite stones and cement. Weep-holes were provided at regular intervals to drain out excess water. Flying buttresses as per original were also constructed to counter any excess pressure on the moat side. The area between the wall and the road was strengthened by filling it with hard laterite rubbles.

243. ROCK-CUT CAVES, ARVALEM, GOA.— All the cracks and fissures were injected with liquid cement and made it waterproof. After preparing slopes to drain out water the whole area was plastered with cement mixed with epoxy. The caves were also provided with iron grills for the safety of the *lingas* enshrined in various caves.

244. CHURCH OF ST. CAJETHAN, GOA.— Cracks developed at the lower rim of the huge dome was sewn together by copper dowels and filling the crevices by liquid cement. Patch plastering at several points were attended to and lotus designs were recarved wherever it had flaked off. Two coats of super

snowcem were applied on the external walls of the church and the doors and windows were painted with plastic emulsion paints.

245. CHURCH AND CONVENT OF ST. FRANCIS DA ASSISI, GOA.—The decayed wooden window frames and shutters on the northern side of the church were replaced by the new teak wood frames. Welded meshes were fixed on the external part of the windows to stop pigeons going inside the church and pecking at the beautiful paintings.

246. THE BASILICA OF BOM JESUS, GOA.—The pathways made of undulated, worn-out and broken laterite stones were removed as it was causing inconvenience to the general public to walk and presenting a shabby look to the whole premises. Instead, new pathways packed with hard laterite rubbles and plastered with cement concrete was laid out.

The arcaded verandah of the quadrangle which had developed cracks at places were repaired by filling up the same with liquid cement. The Art Gallery and quadrangle were applied with two coats of white washing.

247. ARCHAEOLOGICAL MUSEUM, GOA.— The arch behind the Museum, which was precariously hanging, was strengthened by cement plastering. The ancillary portion of the Museum was replastered after removing the dead plaster. It was also provided with doors and windows.

248. CHURCH OF ST. AUGUSTINE, GOA.— The excavated part of the St. Augustine church was properly conserved. Watertightening of the exposed walls adjacent to the convent were also completed.

Mini Circle, Shimla

HIMACHAL PRADESH

249. SIVA TEMPLE, BAIJNATH, DISTRICT KANGRA.— Concreting of the pathway was taken up and completed.

The outhouses of the temple complex were taken up for renovation. The missing I.G. sheet wherever required were replaced with new ones after providing the wooden false ceiling. The door and windows were also replaced with new ones. The roof and other wood work was painted.

250. BUDDHIST MONASTERIES, TABO, DISTRICT LAHAUL AND SPITI.— In continuation of last year's work *(1991-92,* p. 186), the decayed and damaged mud plaster of the walls of the *chortens* (stupas) was removed and replastered (pl. LXVIII). The parapet walls of the Gomphas were reproduced. Pathways around Hbrom-ton, and Byamba Chhibo Gumphas were provided.

251. PHOO GUMPHA, TABO, DISTRICT LAHAUL AND SPITI.— The work of providing pathway in R.R. stone masonry was taken up and completed.

252. TRILOKNATH TEMPLE, MANDI, DISTRICT MANDI.—The work of providing flooring around the temple was taken up and completed.

Patna Circle

BIHAR

253. EXCAVATED REMAINS, NALANDA, DISTRICT NALANDA.— Damaged portions of the Temple 13 and Monastery 6 were repaired by way of underpinning, watertightening and recess pointing.

254. JIVAKAMRAVAN, RAJGIR, DISTRICT NALANDA.— Reparis to the Monastic complex were attended to by resetting the rubble stones and bringing it to plumb.

255. ROHTAS FORT, ROHTAS, DISTRICT ROHTAS.— Flooring of the palace complex was ralaid with *lime-surkhi* mortar in the palace complex.

256. SHER SHAH SURI'S TOMB, SASARAM, DISTRICT ROHTAS.—A provision of *pucca* drain was made all around the tomb to drain out rain-water.

257. ANCESTRAL HOUSE OF DR. RAJENDRA PRASAD, JIRADEI, DISTRICT SIWAN.— Repairs to the ancestral house of Dr. Rajendra Prasad was taken up. The walls of cut-house and cattle-house were restored.

258. RAJA VISAL-KA-GARH, VAISHALI, DISTRICT VAISHALI.—Excavated structures were consolidated by watertightening and recess-pointing.

259. COLOSSAL STUPA, LAURIYA-NANDANGARH, DISTRICT WEST CHAMPARAN.— Underpinning, watertightening and recess-pointing of the colossal stupa was undertaken.

UTTAR PRADESH

260. OLD FORT, JAUNPUR, DISTRICT JAUNPUR.— The work of restoration of the eastern bastion, parapet and collapsed portion of fortification wall were taken up by resetting ashlar stones and completing the missing portions matching with the original, (pl. LXIX).

261. EXCAVATED REMAINS, KUSHINAGAR, DISTRICT PADRAUNA.— The work of recess pointing and watertightening the structures around Nirvana temple and Ramabhar stupa were taken up and completed.

262. ALAMGIR MOSQUE, DHARAHARA, DISTRICT VARANASI.— Dislodged chunks of plaster were removed from walls and ceiling and replastered as per original.

263. CHOUKHANDI STUPA, SARNATH, DISTRICT VARANASI.— Eastern face of the stupa was partly exposed and restored with special sized bricks and lime-*surkhi* mortar.

264. EXCAVATED REMAINS, SARNATH, DISTRICT VARANASI.— Votive stupas and other structures around Asokan pillar were consolidated by watertightening and recess pointing.

265. DHAMEKH STUPA, SARNATH, DISTRICT VARANASI.— Stone encasing work was partly taken up with dressed stone blocks as per original.

Srinagar Circle

JAMMU AND KASHMIR

266. FORT, AKIINOOR, DISTRICT JAMMU.— The missing and fallen fortification wall to the right of entrance gateway was restored in brick masonry to match with the original.

267. SIVA TEMPLE, BILLAWAR, DISTRICT KATHUA.— The defaced and out-of-plumb *mandapa* wall on western side was dismantled and reset in plumb in lime cement mortar. Accretionary structures raised to support the *mandapa* walls were also removed.

268. MONASTERIES, ALCHI, DISTRICT LEH (LADAKH).— The dilapidated *mane-wall* on the front of Dukhang and extending upto corner of Lotsva-Manjushri Ihakhang was dismantled and restored. The top of the wall was also watertightened. The Gurna *chorten* was also replastered and watertightened. The courtyard of Dukhang was also provided with deodar wooden flooring wrought, framed and fixed.

269. MONASTERY, PHYANG, DISTRICT LEH (LADAKH).— The Missing wooden flooring of the sanctum of the monastery was restored to emulate the original in deodar wood wrought, framed and fixed.

270. MANIKHANG LHAKHANG AT LAMAYURU. DISTRICT LEH (LADAKH).— The cracked walls of the Manikhang Lhakhang were dismantled and then reconstructed with stones. Mud plaster was also done to the walls and their tops watertightened.

271. SHEY PALACE, SHEY, DISTRICT LEH (LADAKH).— Missing flooring in the chamber of monastery complex in the palace was restored with deodar wood flooring wrought, framed and fixed to match the original. Collapsed portions of the walls of the palace on the front side were also restored.

272. STUPA AT TISSERU, DISTRICT LEH (LADAKH).— The successive north side square structure of circumambulatory passage was repaired and raised to the height matching with eastern side walls. The openings of the walls were provided with round poles to serve as lintels to take the load of superstructure to be built over it.

273. KALA DERA TEMPLE, BABOR, DISTRICT UDHAMPUR.— The missing wall of platform on the northern side of the temple was restored to match with the original.

274. TEMPLE 1, KIRAMCHI, DISTRICT UDHAMPUR.— The out-of-plumb walls of *antarala* of the temple were dismantled and reset in lime-cement mortar conforming the original pattern.

275. FORT AT RAMNAGAR, DISTRICT UDHAMPUR.— The top of fortification wall on the western side was restored alongwith merlons and battlements.

276. SHEESH MAHAL, RAMNAGAR, DISTRICT UDHAMPUR.— Lime concrete flooring was provided in the chambers of the Sheesh Mahal complex after demolishing the worn-out and damaged flooring.

Vadodara Circle

DAMAN AND DIU

277. BANGLI, DIU, DISTRICT DIU.— The decayed flooring was removed and provided with new Bela stones as per original.

278. ST. PAUL CHURCH, DIU, DISTRICT DIU.—The flooring was pointed after raking out the joints. Two coats of snowcem was applied on the outer wall of Church including patch work for RCC beams staircase.

279. FORT WALL, MOTI DAMAN, DISTRICT DAMAN.—The damaged wall portion was restored with ashlar stone masonry in lime concrete mortar.

GUJARAT

280. JAMI MASJID, DHOLKA, DISTRICT AHMEDABAD.—The out-of-plumb wall was reconstructed as per original pattern and flooring relaid with stones after dressing and carving as per original.

281. MAIN GATE, SARKHEJ, DISTRICT AHMEDABAD.—Decayed wooden beams and other architectural members were dismantled and replaced with new ones as per original.

282. QUEENS MOSQUE, SARANGPUR, DISTRICT AHMEDABAD.— Decayed and dead lime concrete flooring was dismantled and relaid with fresh concrete in lime-cement mortar.

283. AZAM MAUZAM RAUZA, VASNA, DISTRICT AHMEDABAD.— The dead lime concrete was dismantled and removed and relaid with new concrete. Expanded metal *jali* was refixed in wooden frame.

284. DARBARGADH, SIHOR, DISTRICT BHAVNAGAR.—The bulged flagstone of the terrace was dismantled, reset and watertightened. Old Mangalore tiles were replaced and iron frames painted.

285. RAO LAKHA CHHATRI, BHUJ, DISTRICT KUCHCHH.— The stones are dressed and carved as per original pattern for fixing.

286. SAHASTRALINGA TANK, PATAN, DISTRICT MAHESANA.— The work of desilting Rudrakupa and brick masonry was carried out as per original. Collonade portion was dismantled and bulged ashlar stone masonry restored as per original with new Dhangadhra stones.

287. RANI-KI-VAV, PATAN, DISTRICT MAHESANA.—The dressing and carving work of the stone for ashlar stone masonry was completed including desilting work of main shaft of Vav and reconstruction of bulged and damaged portion of side walls.

288. SURYA KUND, MODHERA, DISTRICT MAHESANA.—The resetting work of steps were completed with new stones.

289. JAMI MASJID, PAVAGADH, DISTRICT PANCHMAHALS.— The work of dressing, carving and moulding intricate work of stone pillars and *jali* were completed.

290. MAKAI KOTHAR, PAVAGADH, DISTRICT PANCHMAHALS.— The fallen debris was removed and new wooden lintels were provided.

291. GROUP OF TEMPLES. KHED RODA, DISTRICT SABARKANTHA.—The bulged ashlar stone masonry was reset and cement concrete flooring was relaid with fresh concrete. Missing stone flooring was also reconstructed as per original pattern.

292. OLD ENGLISH TOMB, SURAT, DISTRICT SURAT.— In continuation of last year's work *(1991-92,* p. 188) the dead lime plaster was removed from the walls, pillars and domes and fresh lime plaster work was carried out.

MONUMENTS MAINTAINED BY THE STATES

GUJARAT

The Department of Archaeology, Government of Gujarat carried out the conservation work at following monuments.

293. TEMPLE, BHADESHVAR, DISTRICT KACHCHH.

294. RAM KUND, BHUJ, DISTRICT KACHCHH.

295. SIVA TEMPLE, KERA, DISTRICT KACHCHH.

296. KALESHVARI GROUP OF TEMPLES, LAVANA, DISTRICT VADODARA.

297. TALAV, TEN TALAV, DISTRICT VADODARA.

MANIPUR

The Department of Archaeology, Government of Manipur carried out conservation work at following monument.

298. SHRI SHRI GOVINDAJEE TEMPLE, KANGLA, DISTRICT IMPHAL.—The natural vegetational growth, etc., was removed by mechanical means and filling up of the cracks, pointing, grouting, edging, coping and brick work wherever necessary was carried out.

X. EXPEDITION OUTSIDE INDIA

PRESERVATION OF ANGKORVAT TEMPLE, SIEM REAP, CAMBODIA

In continuation of the last year's *(1991-92,* pp.191-213) work, the Survey resumed the work of structural conservation and chemical preservation of the Angkor Vat temple, Siem Reap, Cambodia. The Indian team was led by B. Narasimhaiah, the other members being M.M. Raichur, R.P. Singh, R. J. Motawala, R.S. Bisht, Ravi Kant, S. Jayakaran, J. Ranganath, M.S.R.K. Prasad, M.I. Shaik, S.P. Singaram, Rajbir Singh, Chanderpal, Bheru Lai and Nand Lai. The works carried out by the Indian team during this season include Southern Central Inner Entrance Porch of Third Enclosure; Northern Central Inner Entrance Porch of Third Enclosure; Southern Wing Gallery on Western side of Third Enclosure; Northern Wing Gallery on Western side of Third Enclosure; South-West Corner Entrance Pavilion of Third Enclosure; Southern Library between Second and Third Enclosures; Northern Library between Second and Third Enclosures; Northern Library between Second and Third Enclosures; Southern Stepped Entrance of Antechamber between Second and Third Enclosures; Northern Stepped Entrance of Antechamber between second and Third Enclosures; Interior of Antechamber between Second and Third Enclosures; Southern Gallery of Antechamber between Second and Third Enclosures; South-East Corner Entrance Tower of Second Enclosure; North-East Corner Entrance Tower of Second Enclosure; Western and Northern Interior of Second Enclosure; North-West Exterior Corner of Second Enclosure; Western and Northern Stepped Entrances of Second Enclosure; Northern Central Stepped Entrance of Second Enclosure; and Stepped Entrance at North-West Corner of Railing between Third and Fourth Enclosures.

STRUCTURAL CONSERVATION.— (a) The porch of Southern Central Inner Entrance Porch of Third enclosure was in a dilapidated condition due to heavy vegetational growth. Even the stone members of the flooring had dislodged. Therefore, the whole structures including plinth and flooring had to be dismantled and reconstructed. The roots penetrated deep into the core of laterite blocks were eradicated from the crevices and joints in the core. Then the crevices and joints were grouted and pointed. Thereafter, the plinth and floorings were reconstructed. After erecting the pillars in their proper positions, the superstructure including beams and the vaulted roof was reconstructed. The structure was watertightened.

Altogether forty-eight (48) Architectural members were dismantled and reset as per the original. In addition, three (3) members which were lying on the ground in a heap were identified and put back in their original position in the structure.

(b) The architectural members of the front portion of the plinth and the flooring of Northern Central Inner Entrance Porch of Third Enclosure were dislodged due to vegetational growth. The

dislodged portions were dismantled and after removing the vegetational growth thoroughly and consolidating the core made of laterite blocks by grouting and pointing, the plinth and the flooring were reconstructed as per the original. Further, the pillars and the beams of the superstructure of the porch, which had gone out-of-plumb were reset in their original position.

Meanwhile three (3) architectural members of the southern topmost *torana* of the main entrance which were lying on the ground nearby were identified and hauled up and fixed in their original positions.

(c) It can be recollected that last year the galleries on northern and eastern sides of Northern wing Gallery on western side of Third Enclosure, where the outer pillars of the verandahs with semi-vaulted roof had gone out-of-plumb and the tie-beams between outer pillars and main pillars of the main galleries had widened joints, had been conserved. In the course of our study the structures, it was found that the problem was not due to any foundation failure or sinking of the pillars, but it was only due to errors committed in the original construction, like having tie-beam in two parts with a joint, socketing the topmost member of the ceiling of semi-vaulted roof within the groove provided in the main beam, etc.

The Northern Wing Gallery, having twenty pillars and equal number of tie-beams in the verandah with semi-vaulled roof, had the same problem as other galleries. But, fortunately the problem was not so severe. Therefore, instead of dismantling some courses of roof stones, simply making free the tie-beams by providing suitable props, they were brought to their original horizontal position and fixed at the joints with epoxy resin and strengthened by providing steel clamp at joints. The beams were locked with each other by providing steel clamps. Thus, the gallery was conserved in all respect.

(d) This South Wing Gallery on western side of Third Enclosure with eighteen pillars supporting the semi-vaulted roof and equal number of tie-beams was also conserved as done in the case of the other galleries. The tie-beams were made free by providing suitable props and then two parts of the tie-beam were mended with epoxy resin. Further, two parts of the tie-beams, outer beams and outer pillars were tied with each other by providing concealed steel clamps. Then the props were removed.

(e) This South-West Corner Entrance Pavilion of Third Enclosure with *gopuram,* cruciform in plan has eight walls, each decorated with beautifully and boldly carved bas-reliefs depicting stories from the *Ramayana,* the *Krishnalila* and Indian mythology. Unfortunately, these intricately carved bas-reliefs have been damaged due to heavy weathering and flaking. This has happened only due to percolation of water from the roof and walls. The rain-water was freely flowing in from the gaps in the roof and walls formed by horizontal movement of the architectural members of the roof and walls. In addition, huge vertical gaps could be seen in the walls and in the corners between door jamb and walls. However, this phenomenal movement of the stones was definitely due to heavy growth of vegetation over the structure, and not in any case due to sinking of foundation or floor. Obviously, to conserve the affected areas of the structure, the architectural members of the affected portions had to be dismantled. It is needless to say that utmost care had to be taken to avoid any disfigurement of the carvings while handling the architectural members.

In the first instance, before taking up the conservation work, the bas-reliefs were consolidated by applying chemicals and by grouting and filleting with suitable cement mortar. Further, before dismantling the roof, suitable scaffolding was erected and every stone of the vaulted roof was supported from inside. While dismantling the roof members, it was noticed that this structure had been dismantled and reconstructed earlier, as the members bear the numbers engraved on them. It can be remembered that the French conservation team, which was conserving the monuments in Cambodia before 1970 had adopted this method of documentation. Therefore, it can be said definitely that the French conservators had worked on this structure. Further, the architectural members which had broken had been provided with unconcealed iron clamps, instead of mending them properly. In addition, the large gaps which were still existing even after conservation were filled up with fine clay and then pointed with cement mortar, instead of resetting the architectural members in their proper position.

This method of filling up the joints proved devastating to the structure. Because, the fine clay helped the fast growth of vegetation, If the previous conservators had understood the problems and the principles of conservation, this structure would not have been in this precarious condition.

Be that as it may, coming to our effort, it was found while dismantling the roof, the architectural members, especially the *toranas* had disintegrated and was extremely difficult to dismantle them. Therefore, they were strengthened and mended *in situ* and then dismantled without causing any damage to them.

After dismantling three hundred and forty-eight (348) stone members of the roof and *toranas* and stacking them systematically at the site, southern wall on the west and western wall on the south, in other words southern and western arms of the south-west interior corner of the pavilion, having bas-reliefs of Ravana lifting Kailasa and Manmatha-sam/zara by Siva respectively, were taken up for conservation. Among the thirteen (13) courses of the walls, the topmost two courses with nineteen (19) members were dismantled. However, the walls with bas-reliefs were not dismantled. Instead, the portions showing pronounced tendencies of slipping and dislodgement were dismantled. Then, the portions where the joints between the members had become wider due to the horizontal movements were pushed back to their original position with the help of horizontal jacks. Subsequently, the dismantled members of the walls were reset in their original position.

In the process of conservation of these two walls, the roof of the exterior semi-vaulted roofed verandah had to be dismantled. Thus, in all forty-five (45) members of the walls and eighteen (18) members of the verandah were dismantled and reset. Another eleven (11) members were reset without dismantling.

Then, the southern and eastern walls of south-east interior corner were also taken up for conservation.

There were large vertical gaps between door-frames and the walls on both sides, and the joints in the masonry had widened due to slipping of the architectural members. Therefore, as in the case of the earlier work, certain portions of the walls were dismantled and reconstructed and wherever necessary the architectural members were pushed back to their original position by using horizontal

jacks without dismantling the members. In the process of conservation sixty-three (63) architectural members dismantled and reconstructed. Another seven (7) members were reset without dismantling. In addition, fourteen (14) decorative columns of window-screen were also dismantled and reset. Thus, the bas-reliefs of *Vali-samhara* and Dakshinamurti Siva, respectively on southern and eastern walls were conserved.

Likewise, two southern, eastern and western walls of north-east and north-west interior corners were conserved. As in the case of the earlier work, some of the portions of the walls were dismantled. After resetting the slipped and dislodged architectural members of the walls by pushing them back to their original position by using horizontal jacks, the dismantled portions were reset as per the original. In the process of conservation one hundred and sixteen (116) architectural members and sixteen (16) decorative window were dismantled and reset. Thus, the bas-reliefs representing life in the ship, Krishna lifting Govardhana mountain, *Samudramanthana* and Bhikshatana Siva were thoroughly conserved.

After completing the conservation of the walls of the pavilion, the dismantled architectural members of the vaulted roof and the *toranas* were reset by using five hundred and eight (508) stone members. The whole structure was then made watertight by grouting the crevices and pointing the joints.

(f) Southern Stepped Entrance of Southern Library between Second and Third Enclosures was in a dilapidated condition as the architectural members had been dislodged from their original position. Therefore, certain portions had to be dismantled and reset to bring the structure to its original shape. Altogether twenty-four (24) architectural members were dismantled and reset, and another ten members were reset by using horizontal jacks and by human effort. In addition, seven (7) members which had been dismantled some decades earlier and stacked nearby were identified and refixed in their original positions in the structure.

Some portion of the Northern Stepped Entrance were also dismantled and reset, as the dislodgement of the architectural members was pronounced and vegetational growth was very deep. Altogether eleven (11) members were dismantled and reset and another five (5) members displaced from their original position were reset as per the original.

(g) Northern Library, oriented east-west and measuring 32.90 x 18.90 m, is one of the most beautiful structures in the complex, standing majestically to a height of 14.50 m . This structure had suffered most due to vegetational growth and negligence. Therefore the collapsed and dislodged portions had to be dismantled wherever necessary and reconstructed as per the original.

Massive stepped entrance with flanking balustrades, plinth and landing of southern facade has suffered due to heavy vegetational growth. The architectural members had dislodged severely. Therefore, major portions had to be dismantled and after consolidating the core, the dismantled portions had to be reset as per the original. Altogether forty (40) architectural members were dismantled and reset. Another eleven (11) members which had also been displaced were fixed in their original position with the help of horizontal jacks and by human efforts.

The dislodged members on the south-east corner of the massive plinth and the landing were also dismantled and reset as per the original. In the process, fifteen (15) architectural members were dismantled and reset.

The dilapidated and precarious overhanging whole northern facade including portions of the plinth, landings and stepped entrance flanked by balustrades were dismantled and the core made up of heavy laterite blocks consolidated and then the dismantled portions were reset as per the original. Altogether one hundred and forty-five (145) members were dismantled and reset. In addition, one (1) architectural member which was lying in a heap of stones was identified and refixed in its original position.

The dislodged architectural members of the eastern facade including plinth and stepped entrance flanked by massive balustrades were also dismantled and reconstructed as per the original after consolidating the damaged core. The displaced architectural members were pushed back to their original position with the help of horizontal jacks and by human efforts. While conservating this facade, thirty-six (36) architectural members were dismantled and reset and another nine (9) members were reset without dismantling.

The whole of western facade including massive double plinth stepped entrance flanked by balustrades and landings, entrance porch and topmost *torana* was in dilapidated condition. Therefore, the conservation work has to be carried out with great care on priority basis in a phased manner. The overhanging decorative *torana* of the vaulted roof at a height of more than 13m was provided a platform of wooden planks supported by scaffolding at a height of 13 m, i.e., around the base of the *torana* and reconstructed after consolidating and mending the weathered and crushed pieces. While conserving twenty-seven (27) members were dismantled and reset as per the original.

Meanwhile, the topmost course of the roof stones, seven (7) in number, which had been dislodged were also reset in their proper position. The collapsed overhanging southern and northern portions of the entrance porch were also dismantled and the members were systematically stacked. Fallen eleven (11) members were identified and shifted to the spot. Altogether seventeen (17) members were dismantled. After conserving the massive double plinth, stepped entrance, etc., the plinth and flooring of the porch were dismantled and reconstructed as per the original. Altogether twenty-five (25) architectural members were dismantled and reset. The massive double plinth, stepped entrance with flanking balustrades and landings were in dilapidated condition due to dislodgement of their architectural members. These were taken up for conservation as a precautionary measure before taking up the reconstruction of the porch over the double plinth.

The dilapidated plinth portions and the balustrades were dismantled. After consolidating the core which had been badly damaged due to penetration of roots and percolation of rain water and after reconditioning the flight of steps, the portions were reconstructed as per the original. Altogether one hundred and nine (109) architectural members were dismantled and reset in the process of conservation. Another three (3) members which were lying on the ground due to collapse of a portion were put back in their original positions in the structure.

However, the Northern Library as a whole could not be conserved due to the time factor. Some of the major items of work to be executed are : reconstruction of the western porch after consolidating the existing pillars and casting a missing one; conservation of eastern entrance porch; resetting the dislodged *toranas* and watertightening the roof.

(h) The architectural members of the plinth and the steps of the Southern Stepped Entrance to Antechamber between Second and Third Enclosures had been dislodged from their original position due to heavy growth of vegetation. The members of the plinth, balustrade and steps were dismantled and after eradication of vegetational growth with roots from the core and plugging of the crevices and joints, the dismantled portions were reset. Altogether fifty (50) architectural members were dismantled and reset. Further, the structure was watertightened by grouting and pointing the joints.

(i) The Northern Stepped Entrance to Antechamber between Second and Third Enclosures had suffered due to heavy growth of vegetation as in the case of other entrances. While conserving this structure twenty-two (22) architectural members had to be dismantled and reset as per the original, as members had been dislodged from their original positions.

(j) The pillars of the Interior of Antechamber between Second and Third Enclosures which is cruciform in plan, were in damaged condition and the members of the semi-vaulted roof were missing. Thus, the whole chamber was giving a dilapidated look. Therefore, twenty-eight (28) damaged pillars were strengthened by providing concealed steel belts and mending wherever necessary. The missing members of the roof of the varandah were provided with RCC moulded ones to a length of 100 m. Further work could not be done due to shortage of time.

(k) The accretionary platform of the Southern Gallery of Antechamber between Second and Third Enclosures built recently of laterite blocks and earth filling was not only ugly looking due to the dust and dirt but also an obstacle to the easy movement of the visitors. This structure was removed and relaid with new blocks (pl. LXX). A number of broken architectural members and sculptures were also found. The good pieces numbering twenty-three (23) were collected and exhibited on suitable pedestals and small platforms.

(1) Missing and dislodged topmost portion of the South-west corner Entrance Tower of Second Enclosure thirty (30) in number, were reset and the top opening sealed by providing RCC slab. The crevices and joints were grouted and pointed so that no vegetation grows over the structure.

(m) In continuation of last season's work, twenty-six (26) dislodged architectural members of the North-east corner Entrance Tower of Second Enclosure were reset in their proper position. In addition, seven (7) architectural members of the decorative *torana* on the west, which had been dismantled sometime before 1986 and stacked on the roof of the attached gallery, were identified and reset in their proper position. All the crevices and joints were thoroughly grouted and pointed and watertightened.

(n) It is heartening to know that the welded mesh provided last season in the First Enclosure has totally eradicated the bat and bird menace. This season, the interior of Second Enclosure on western and northern sides including galleries and entrance pavilions were provided with welded mesh.

(o) Some of the stones of the North-west exterior corner of Second Enclosure were overhanging precariously and some had already fallen down. While conserving the dislodged portion six (6) architectural members were reset in their original position and another three (3) fallen members were hauled up and fixed in their original positions in the structure.

(p) Western Stepped Entrance of the western and northern stepped Entrance at north-west corner of Second Enclosure had suffered due to thick growth of vegetation and dislodgemnt of architectural members. Sixty-five (65) members of the plinth, balustrades and steps were dismantled and reset after removing the deep rooted vegetation and consolidating the core. In addition, two (2) stones of balustrades weighing nearly four tonnes each which had fallen down were hauled up and fixed in their original positions. Then the whole structure was watertightened.

The affected portions of the plinth, balustrades and steps of the Northern Stepped Entrance were also dismantled and reconstructed as per the original after consolidating the core. While conserving, seventy-four (74) architectural members were dismantled and reset. Another four (4) members which were lying on the ground were identified and hauled up and fixed in their original positions. Then the structure was thoroughly watertightened.

(q) Dislodged and out-of-plumb architectural members of plinth, stepped entrance with flanking balustrades, landings and the porch of the Northern Central Entrance Porch of Second Enclosure were dismantled and stacked inside the pavilion for easy lifting and fixing the members while reconstructing.

Then, the western balustrades and a portion of the plinth were dismantled. After consolidating the core and resetting the dislodged steps, the dismantled portions were reset as per the original. Subsequently the eastern balustrade upto first landing was also dismantled and reset after consolidating the core. Altogether, fifty-five (55) architectural members were dismantled and reset, and another fourteen (14) members were reset without dismantling, but with the help of horizontal jacks and by human effort. In addition, three (3) huge architectural members which were lying on the ground were identified and fixed in their original position in the structure. Then the whole structure was watertightened. The conservation work of the porch could not be completed.

(r) Stepped Entrance at North-west corner of Railing between Third and Fourth Enclosures had been dismantled and was partially reconstructed by the French team before 1970. The whole railing all around was in dilapidated condition due to heavy growth of vegetation. Therefore, with a view to reconstructing it, the whole railing must have been dismantled. Then the reconstruction must have been started from different points with the intention of completing the work quickly. But, unfortunately errors crept in. Therefore, the ends of the two opposite works could not meet. This situation can be seen even today at several places all around.

Be that as it may, due to exposure for a long period of time, the core was deteriorating and vegetation was growing freely. Therefore, the structure had to be further dismantled by our team. The core was consolidated by replacing eleven (11) damaged laterite blocks with new ones and by removing the vegetation and grouting the crevices and holes. Then, the structure was reconstructed rectifying the errors as far as possible In all forty-eight (48) architectural members including eleven (11) members

dismantled earlier were reset as far as possible in their original position. The structure was water-tightened by grouting and pointing.

CHEMICAL PRESERVATION.— During this season, the whole Third Enclosure had to be chemically recleaned and preserved. Thus, the area covered is nearly 34,000 sq m. In addition, *Samudramanthana* bas-relief panel which had been exposed to nature for several decades due to dismantling of the roof by the French before 1970, was chemically cleaned and preserved. The area covered is nearly 1,000 sq m.

Some of the areas in the Second Enclosure including north-west and south-east corner Entrance Towers were also (pl. LXXI) chemically treated and the area covered is nearly 8,000 sq m.

Southern library between Second and Third Enclosures was also chemically cleaned and preserved. But the northern one could not be chemically cleaned and preserved as the conservation work is in progress. However, the area covered is nearly 5,000 sq m.

The Esplande on western side in front of Third Enclosure entrance was also chemically cleaned and preserved. The area covered is nearly 5,000 sq m.

However, in the Fourth Enclosure, the chemical cleaning and preservation work could not be completed. But an area covering nearly 2,000 sq m could be completed.

In addition, the bas-reliefs in the north-west and south-west corner entrance pavilions of the Third Enclosure were consolidated by edging, filleting, grouting, pointing and chemically preserving. Now, the bas-reliefs have been saved from further deterioration. The area covered is nearly 800 sq m.

The surface was moistened by spraying water. Then, the area was cleaned with 1 to 2 percent solution of liquid ammonia, only to neutralize the acids secreted by the hyphae of the micro-vegetation, mixed with teapol, a non-ionic detergent, by brushing gently with nylon, tooth and coir brushes as the case may be with extreme care. Once again the surface was cleaned thoroughly in water. The area thus cleaned was treated with 2 percent solution of polycide, biocide and zinc-silicofluoride separately. After complete drying of the area, it was preserved by applying a coat of 2 percent solution of polymethyl methacrylate in toluene.

XI. ARCHAEOLOGICAL CHEMISTRY

TREATMENT ON MONUMENTS AND PAINTINGS[1]

ANDHRA PRADESH

1. VEERABHADRASVAMY TEMPLE, LEPAKSHI, DISTRICT ANANTPUR.—Profused mural paintings on the ceiling and walls of different chambers of the temple which had become obscured due to superficial deposition of soot, dust and dirt etc. were subjected to chemical treatment using various suitable solvents, *viz.,* triethanolamine, methyl alcohol ethylene glycol, etc. About 87 sq metre was chemically cleaned and preserved using 1-2 % solution of polyvinyl acetate in toluene as consolidant and preservative.

2. RAMESHWARASVAMY TEMPLE, TADAPATRI, DISTRICT ANANTPUR.— The chemical treatment work continued on sculpture of *Kalyanamandapa,* the corridor, western tower and the eastern side cloister. The removal of superficial accretions, micro-vegetational growth, lime wash coat and ochre patches was affected by chemico-mechanical means. The cleaned area was preserved with polymethyl methacrylate after fungicidal treatment.

3. VENKATESVARA VISHNU TEMPLE, SRINIVASA MANGAPURAM, DISTRICT CHITTOOR.—*The navaranga* and *mahamandapa* of the monument were subjected to chemical treatment for the removal of vegetational growth, soot and oily accretions apart from dust, dirt and lime coat by using non-ionic detergent and mild base, *viz.,* teepol and ammonia. The patches of limewash from the interior were removed by chemico-mechanical method using dilute acetic acid. The entire area was given fungicidal treatment followed by a preservative coat on the dry surface.

4. MADHUKESVAR TEMPLE, SRIMUKHALINGAM, DISTRICT SRIKAKULAM.— Vegetational growth, dust, dirt and lime plaster accretionary deposits from the deplastered surface of two subsidiary shrines and walls of the main entrance were eradicated by teepol, ammonium hydroxide and dilute acetic acid. After spraying zinc-silicofluoride on thoroughly cleaned surface, 1-2 % solution of polymethyl methacrylate in toluene was applied as a preservative coat.

5. THOUSAND PILLAR TEMPLE, HANAMKONDA, DISTRICT WARANGAL.— The temple was infested with thick deposits of soot, dust, dirt, oily accretions, vermilion marks and lime wash, etc. These accretions were removed with the help of suitable chemicals, *viz.,* acetic acid, oxalic acid, sodium hexametaphosphate, etc., and preserved with 3% solution of Acrypol-P in toluene after fungicidal treatment and complete dryness.

---

[1] Information from : 17-18,20,25-26, Department of Archaeology, Government of Gujarat; and the rest from Chemical Branch of the Survey.

ARUNACHAL PRADESH

6. TAWANG MONASTERY, TAWANG, DISTRICT TAWANG.— Old darkened varnish layer and other greasy accretions were removed from the canvas paintings fixed on the interior wall of the Meera Lama gumpha. Rectified spirit and methanol were used and turpentine as restrainer. At some places, the selective use of a few drops of ammonia or morpholine with rectified spirit was also made. Detached portions of the paintings were refixed. 1 % solution of polyvinyl acetate and picture varnish were used as preservative. The work is in progress.

BIHAR

7. EXCAVATED SITE, NALANDA, DISTRICT NALANDA.— Thick layers of micro-vegetational growths of moss and lichens were eradicated from Temple 2 and a portion of brick structure at Sarai mound by using dilute ammonia with teepol solution. Sodium pentachlorophenate was sprayed as fungicide and then the completely dry area was preserved with polyvinyl acetate solution in toluene. The work is in progress.

8. EXCAVATED SITE, KOLHUA, DISTRICT VAISHALI.— Eradication of vegetational growth from the structural remains was continued and completed by using sodium pentachlorophenate as fungicide followed by preservative coat of polyvinyl acetate solution.

9. STUPA AND RAJA VISHAL KA GARH, VAISHALI, DISTRICT VAISHALI.— The work of chemical treatment for the removal of dust and vegetational growth was continued using dilute solution of ammonia and teepol mixture. The entire exposed structure was chemically cleaned and preserved with 3% solution of polyvinyl acetate after proper fungicidal treatment with 5% solution of sodium pentachlorophenate.

DAMAN AND DIU

10. FORT WALLS, MOTI DAMAN, DISTRICT DAMAN.—Eradication of micro-vegetational growth and other accretionary deposits was continued from the fort walls with ammonical solution and teepol. The cleaned areas were given a coat of 2% fungicidal treatment with zinc-silicofluoride and finally polyvinyl acetate in toluene was used as preservative.

11. SAINT PAUL'S CHURCH, DIU.— Deposit of dust, dirt and other accretions from carved wooden altars, chapels and pulpits was erased using suitable organic solvents. The chemically treated area was preserved with wooden preservative.

DELHI

12. RED FORT, DELHI.— The chemical treatment and preservation of Bhadon pavilion was resumed and completed. The marble surface which was chemically treated last year, had rewitnessed the superficial deposition of dust, dirt, smoke, soot, etc., contributed by various sources of pollution from nearby areas, *viz.,* heavy vehicular traffic, thermal power station, railway yard, etc. Such areas alongwith untreated surface were cleaned using dilute solution of ammonia-teepol and clay pack technique to remove all types of deposited accretions. The marble surface thus exposed has good original lustre.

The accumulated superficial accretions like dust, dirt and sooty matter were also removed from the paintings of the ceiling of Diwan-i-Khas (pl. LXXII). The fragile cracked painted areas were consolidated with bees wax impregnation using hot spatula to keep wax in liquid state to the possible extent. The detached fibrous support was fixed back to the wooden ceiling using animal glue to which sodium penta chlorophenate was added in order to prevent further growth of micro-organism. Methyl alcohol was predominantly used to remove old preservative coat and other organic solvents for removing other kinds of accretions from the painted surface. The work is in progress.

The fortification wall between Lahore gate and booking office was taken up for eradication of patchy algal growths, birds's excreta, superficial dust and dirt accretions. The chemically cleaned area was preserved after fungicidal treatment.

Thick deposits of smoke, soot and greasy matter from Khas Mahal was removed by using a mixture of teepol ammonia and a few drops of triethanolamine with the help of cotton. Methyl alcohol was used for the removal of residual oily matter from the surface. The treatment was confined to the interspaces between floral designs. The colourful inlay work was brightened up by using organic solvents. The work is in progress.

Old preservative layer together with surface accretions of dust, dirt and soot was removed from the marble surface of Sawan pavilion using organic solvents followed by solution of ammonia teepol mixture. Clay pack method was also employed to remove sticky accretionary deposits. The work is in progress.

Front side of the rampart under flag mast and *burg is* above it were subjected to chemical treatment with mild ammonical solution and non-ionic detergent. The preservative coat was applied to the properly dried surface after the fungicidal treatment to the treated areas.

13. HUMAYUN'S TOMB, NIZAMMUDDIN, NEW DELHI.— Accretionary deposits, vegetational growth, dust, dirt and remnants of beehives on the exterior surface of north wall of the tomb were removed with liquor ammonia and teepol. Hydrogen peroxide solution was also used to get rid of stains on marble surface. Petroleum ether was employed to sweep bees wax sticking to the wall. Sodium penta chlorophenate was used as fungicide and polyvinyl acetate as preservative.

14. QUTB COMPLEX, NEW DELHI.— The patches of calcarious deposits from entrance gates of the building, the interior portion decorated with inscribed and uninscribed design were treated with dilute acetic acid. The adherent layers were removed with sodium hexametaphosphate solution. The work is in progress.

GOA

15. SE-CATHEDRAL CHURCH, VELHA GOA.— Patches of lime and old varnish from panel and mural paintings in blessed sacrament on the entrance arch near cross altar were removed and cleaned.

16. ST. FRANCIS ASSISI CHURCH, VELHA GOA.—In continuation of last year's *(1991 -92,* p.200)work, fifty-four panel paintings were chemically cleaned and preserved. General cleaning and varnishing of wooden carvings of choir room and railing were also taken up. The work is in progress.

GUJARAT

17. DHARAMSHALA, TAL, TALALA, DISTRICT BHAVNAGAR.— D.D.T. sprayed on wall painting was removed with cotton in dry condition^ and then with plain water. Care was taken that pigment of painting should not be effected by water. Lime coating was removed with n-butanol + iso proponallin (1 : 1) proportion mixture with cotton. The chemically treated wall paintings were preserved with *2%* solution of polyvinyl acetate in toluene (sulphur free).

18. ZAVERI'S HAVELI, GANDHINAGAR, DISTRICT GANDHINAGAR.— Hydrin-30 mixed with kerosene oil/water was applied on the termite affected wooden carved parts with paint brush. Then the wooden parts of haveli were preserved with paste made from Gammaxin powder (10% B.H.C.) mixed with kerosene oil or water.

19. STEP-WELL, ADALAJ, DISTRICT GANDHINAGAR.—The stone surface of the step well having thick vegetational growth were removed by using ammonia and teepol and dilute glacial acetic acid. After appropriate fungicidal treatment, the entire cleaned area was preserved with polyvinyl acetate in toluene.

20. ANCIENT TEMPLE NEAR VISHAWADA, TALUK PORBANDAR, DISTRICT JUNAGADH.—Dust and micro organism algae was removed from *chaitya* windows, carving, *amalaka* and walls of the ancient temple with dry coir brush and then with mixed solution of 3% to *5%* liquid ammonia + teepol + water. The solution applied with smooth brush and remain on carving, *chaitya* windows, *amalaka* and walls for ten minutes for reaction. Then rubbed with coir brush and applied water and completely washed with water. After the stone surface is completely dried, fungicide zinc-silico-flouride zusi F6 5% in water applied on stone surface of ancient temple. Finally polyvinyl acetate in toluene was applied as a preservative.

21. GALTESVARA TEMPLE, SARNAL, DISTRICT KHEDA.— The *mandapa* and *arddha-mandapa* of the temple were covered with thick growth of moss and lichens. Dilute liquor ammonia and teepol mixture was used to remove the biological growths. Dilute glacial acetic acid was removed using dilute glacial by physico-chemical means. After thorough washing, the entire surface was given proper fungicidal treatment and then preserved with polyvinyl acetate in toluene after proper drying.

22. SUN TEMPLE, MODHERA, DISTRICT MAHESANA.— Sculptures, carvings and outer *sikhara* of the temple were subjected to chemical treatment for the removal of superficial accretions of sooty dust deposit, leached salts from the stone surface, micro-biological growths, etc. The cleaned surface was given fungicidal treatment and then a preservative coat of polyvinyl acetate in toluene was applied after proper drying.

23. MALAI MATA TEMPLE, PALODAR, DISTRICT MAHESANA.— The sculptures and carvings on the exterior of the temple were preserved after eradication of moss, lichens and lime coating using various suitable and recommended chemicals. To prevent the early micro-biological regrowth of fungicidal, preservative coats were applied to the chemically cleaned surface.

24. RANI-KI- VAV, PATAN, DISTRICT MAHESANA.—The work of chemical cleaning of sculptures and carvings of III phase of the Rani-ki-Vav was taken up and the soil/mud deposits, micro-biological

growths from stone sculptures were removed to restore fine carvings. The cleaned surface was given fungicidal treatment and preservative coat after proper drying.

25. TARNETAR TEMPLE, TARNETAR, TALUK CHOTILA, DISTRICT SURENDRANAGAR. — Lime coating on sculptures and carvings in the walls and *chaitya* windows was removed mechanically with wooden pointers. Then remaining lime coating was removed by 5% acetic acid CH_3, water mixed solution and then the surface was rubbed with coir brush, the treatment continued till the lime coating is completely removed. The surface was washed with water. After the surface is fully dried 4% polyvinyl acetate in toluene (sulphur) was applied as a preservative coating.

26. SHILALEKH, ZILKESHVAR ZINZUWADA, TALUK. DASADA, DISTRICT SURENDRANAGAR.------Shilalekh affected with mud, *sindur* (vermillion) and *geru* colour was treated with solvent acetone and water and consolidated with 4% polyvinyl acetate in toluene (Sulphur free).

27. TAMBEKARWADA, VADODARA, DISTRICT VADODARA.— Superficial dust and dirt from the murals were removed carefully either with sterilized cotton swabs or with soft sable hair brushes and the adherent deposits of greasy matter embedded with dust/dirt particles were removed using a mixture of suitable organic solvents.

HIMACHAL PRADESH

28. BANSI-GOPAL TEMPLE, CHAMBA, DISTRICT CHAMBA.— Exterior of this sandstone structure infected with vegetational growth cushioned with dust/dirt was subjected to chemical treatment. Dilute liquor ammoina and teepol were used to eradicate the-moss and lichen growths. Dilute acetic acid was employed to loosen the lime accretions within the carvings of stone surface. Thoroughly cleaned area was given fungicidal treatment followed by preservation with polymethyl methacrylate solution in toluene.

29. CHANDRAGUPTA TEMPLE, CHAMBA, DISTRICT CHAMBA.—Deposition of lime plaster and growth of moss and lichen hiding the details of carvings and original colour of sandstone were the main problems. The removal of biological growths was carried out with mixture of 1 -2% ammonical and 1 % teepol solution. Lime plaster accretionary deposits were removed with the help of dilute acetic acid by physico-chemical means. Zinc-silico fluoride (1 % suspension) as fungicide and polymethyl methacrylate acetate in toluene as preservative were applied to the chemically treated and cleaned surface.

30. PANCHAVAKTRA TEMPLE, MANDI, DISTRICT MANDI.— Due to the use of *dhoop,* incense sticks, the inner surface of the structure was covered with smoke, soot, grease, etc. Aqueous solution of ammonia-teepol together with few drops of triethanolamine, was used to clean the surface. A 2-3% aqueous solution of sodium bicarbonate was also employed to remove tenaciously adhering and grease traces. The cleaned area was preserved after fungicidal treatment.

KARNATAKA

31. GOMMATESVARA STATUE, SRAVANABELAGOLA, DISTRICT HASSAN.— Patches of vegetational growth and other superficial accretions were removed by using ammonium hydroxide and non-ionic detergent. Approximately 200 sq metre area was chemically preserved during the year.

32. DARIYA DAULAT BAGH, SRIRANGAPATNA, DISTRICT MANDYA.— In continuation to last year's *(1990-91,* p. 203) work, chemical cleaning of paintings, filling of lacunae in the rendering, filleting of the broken edges, reintegration of the consolidated area were attended in the ceiling of western verandah. About 182 sq metre area was completed.

33. PANCHALINGESVARA TEMPLE, GOVINDANAHALLI, DISTRICT MANDYA.— Vegetational growths, lime wash and ochre patches from the exterior of this temple including the two *nandi-mandapas* in front of the two entrances to the shrine were removed and chemically preserved.

34. NARAYANASVAMY TEMPLE, MELKOTE, DISTRICT MANDYA.— Carved areas of the eastern entrance, main tower, inner eastern *prakara* and the interior of *navaranga* hall were subjected to chemical cleaning for removal of oil and sooty matter and lime wash by using aqueous solution of liquor ammonia non-ionic detergent, glacial acetic acid, etc. The treated areas were preserved with 1% solution of Acrypol-P 876 in toluene. The work is in progress.

35. GOMMATESVARA STATUE, KARKALA, DISTRICT SOUTH KANARA.— Removal of accretionary deposits of oil, vermillion paste, micro-vegetational growth, lime wash, ochre streaks, etc., was continued. In addition to inorganic chemicals like liquor ammonia, teepol, glacial acetic acid and sodium carbonate, organic solvents, *viz.,* acetone, benzene, etc., were also used for chemical cleaning of the above noted accretions. Acrypol-P 876 was applied as preservative after fungicidal treatment with sodium pentachlorophenate.

KERALA

36. SRI PARASURAMA TEMPLE, THIRUVALLA, DISTRICT THIRUVANANTAPURAM.— *Vimana* of the main shrine, sculptures, carved pillars, etc., were treated chemically for the removal of oily and sooty accretions, lime wash, enamel paints and colours in addition to the vegetational growths. Lime wash was removed using dilute acetic acid by chemico-mechanical means and the vegetational growth were removed using mixture of dilute liquor ammonia and teepol whereas enamel paints and colours were removed by using dilute castic soda and then throughly washed. The remnants of the paint marks were removed using different organic solvents. The chemically cleaned area was given the fungicidal treatment followed by preservative coating on the cleaned and dried surface.

MADHYA PRADESH

37. KANDARIYA MAHADEVA TEMPLE, KHAJURAHO, DISTRICT CHHATTARPUR.— The north and east facing walls of *sikhara* and the sanctum of this temple were subjected to chemical treatment for the removal of accretionary deposits of dust, dirt, lime, birds dropping and micro-vegetational growth by using mixture of liquor ammonia-teepol and acetic acid as per requirement. The treated area at some places was given the surface consolidation treatment using 1% polymethyl methacrylate solution in 3-4 applications. The entire cleaned area was preserved after fungicidal treatment. The work is in progress.

38. WESTERN GROUP OF TEMPLES, KHAJURAHO, DISTRICT CHHATTARPUR.—A large number of eroded figures, friezes and mouldings on the outer walls of Vishwanatha temple, Nandi temple and Laxman

temple were subjected to surface consolidation besides chemical cleaning for the removal of lime and micro-biological growths. The consolidated areas were given the fungicidal treatment and finally preserved with 1-2% solution of polymethyl methacrylate and the work is in progress.

39. ROCK-CUT CAVES, BAGH, DISTRICT DHAR.— Strengthening of pulverized sandstone of the sculptures of Buddha and his attendants in the vestibule of Cave 4 was completed to restore their original look. Work of stripping of painting in lower half of the eastern wall of Cave 4 was undertaken by "de-stacco" technique. The stripped painting was taken to conservation workshop for mounting on the new support/carrier. Intact fragments of paintings in Cave 2,3 and 4 were chemically cleaned and preserved.

Periodical fumigation of Cave 2, 3 and 4 is being carried out with dichlorovos, baygon, pyrethrum, etc. The mounted panels were examined carefully and regularly to check them against attack by insect, fungal growth and rodent activities.

40. MOHAMMAD GHAUS TOMB, GWALIOR, DISTRICT GWALIOR.— In continuation of the previous year's work, the eradication of bio-deteriogens and other accretionary deposits was completed. The lime plaster surface was treated with 1 % solution of sodium entachlorophenate and finally preserved with 2-3 coats of 1% solution of polymethyl methacrylate acetate in toluene.

41. TELI-KA MANDIR, GWALIOR FORT, DISTRICT GWALIOR.—Exterior surfaces of front doorway and vestibule badly infested with heavy growth of micro-flora like moss and lichen causing weathering of sandstone were eliminated by gentle brushing with ammonia-teepol mixture. A 1% solution of zinc-silico fluoride was applied as fungicide on the cleaned surface and finally preserved with 2% solution of polymethyl methacrylate acetate in toluene.

42. STUPA, SANCHI, DISTRICT RAISEN.— The entire sandstone surface of upper pathway railings was chemically cleaned to eradicate the growth of moss, lichen, bird droppings and other accretions. Fungal stains were removed using hydrogen peroxide. Fungicide and preservative coats were applied to the chemically cleaned stone surface.

MAHARASHTRA

43. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD.— The bulged areas of the painted surface on the north and west wall of Cave 17 were fixed back to the mud plaster by injecting mixture of plaster of Paris and fevicol. The painted surface which over the years has slowly developed chalkiness was treated with selective organic solvents.

Removal of thick grime, natural resins, grease, etc.,was carried out from painted plaster of sitting and standing Buddha figures in the ante-chamber of Cave 6. The work is in progress.

Removal of stains of honey bees wax interspersed with soot besides micro-biological growth and ingrained dust in the facade of Cave 10 was continued. After removing the stains and accretions, sodium penta-chlorophenate was applied as fungicide followed by preservative coat of polyvinyl acetate in toluene. The efforts are being made to procure develop some repellants to frustrate the honey bees from dwelling the cave again. . . ,

Paintings on north and south walls of Cave 9 were subjected to chemical treatment for the removal of very thick darkened hard coats of natural resins. Though the progress is very slow but the recent experiments yielded good results and a beautiful human figure was exposed. The work is in progress.

Filleting and fixing of paintings in Cave 19 was continued together with consolidation of bulging, filling of holes, etc.

Insecticidal treatment in Cave 1, 2,16,17 and 22 is being carried out periodically to check the insect activities and to prevent damage to the paintings. The paintings under the glass frame in Cave 10 were also given insecticidal treatment.

Recording of temperature and relative humidity in Cave 1,2,6,16 and 17 is being done regularly using hygrometer, thermohygrograph and thus differential relative humidity and differential tempera-ture.

44. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.— The chemical treatment to theentrance area of the tomb was continued for the removal of micro-vegetational growth from the stoneand lime plaster surface using dilute solution of aqueous ammonia and non-ionic detergent with gentle brushing. Brown spot were removed with chloramine-T. The cleaned surface was given a fungicidal coat of 2% sodium pentachlorophenate followed by reservative coat of 3% polymethyl methacrylate solution on the dried surface.

45. GRISHNESHVAR TEMPLE, ELLORA, DISTRICT AURANGABAD.— Chemical cleaning for eradication of micro-vegetational growths was continued. On a very few specific spots, where it was not possible to take out the accretions easily by usual methods formalin was used to remove more adherent growths. The broken pieces of stones were joined and after fungicidal treatment, the entire area was preserved with Acrypol-P in toluene.

46. CAVE, ELLORA, DISTRICT AURANGABAD.— Removal of thick tenacious layer comprising dust, dirt, soot and old varnish from the paintings of *Nandi-mandapa* of Cave 16 was continued. Wherever necessary, filleting, fixing and filling of gaps was also attended. Several selective, specific organic solvents and their mixtures based on their volatility, toxicity and dissolving capacity were used to achieve satisfactory results. A total of 9-7 sq metre area was treated and a panel depicting the scene of the childhood activities of Lord Krishna was exposed.

47. KANHERI CAVES , BOMBAY, DISTRICT BOMBAY.—Chemical cleaning of stone insertions is being carried out in these caves using solution of ammonia and non-ionic detergent. To prevent early cryptogamous regrowth, 1 % solution of sodium pentachlorophenate was applied on the cleaned surface and then preserved.

48. AravESHVAR TEMPLE, SINNAR, DISTRICT NASK.— Sculptures of the temple were subjected to chemical cleaning for getting rid of surface accretions using ammonium hydroxide and teepol mixture. Sodium pentachlorophenate was applied as fungicide followed by preservative coating of Acrypol-P in toluene.

49. AMBERNATH TEMPLE, AMBERNATH, DISTRICT THANE.— Stone sculptures of the temple were cleaned with gentle brushing using dilute solution of a mixture of ammonia-teepol. A 1% aqueous solution of sodium pentachlorophenate was applied as fungicide and finally the entire treated area was preserved with Acrypol-P in toluene.

ORISSA

50. BUDDHIST MONASTERY, RATNAGIRI, DISTRICT CUTTACK.— About ninety-seven sculptures, consisting of Buddha heads, stupas and Buddha images were taken up for the removal of dried moss, lichens and deposits of dust and dirt. Apart from ammonia and teepol, dilute aqueous solution of oxalic acid was also used to eradicate black patches and stains. Zinc-silico-fluoride and polyvinyl acetate in toluene were applied as fungicide and preservative coats respectively.

51. ASOKAN INSCRIPTIONS, JAUGADA, DISTRICT GANJAM.— Deposits of lime plaster, cement and reddish tint obscuring the inscriptions, were loosened by repeated contact with dilute acetic acid and tartaric acid with cotton swabs. Ammonia teepol solutions were used to remove vegetation growths wherever exist. After thorough flushing the surface, fungicide was applied to the dried surface followed by preservative coating of polymethyl methacrylate solution.

52. LORD LINGARAJA TEMPLE, BHUBANESWAR, DISTRICT PURL— Removal of thick vegetational growth and layers of dust and dirt from *the. jagamohana, nata-mandapa* and *bhoga-mandapa* of the temple was continued using dilute solution of ammonia and teepol mixture with mild brushing. The application of fungicide and preservative coats to the entire cleaned surface was completed.

53. ASOKAN INSCRIPTIONS OF DHAULI, BHUBANESWAR, DISTRICT PURL— The Asokan rock edicts at Dhauli were completely covered with dust, dirt, soot and moss growths. After cleaning chemically, 1 % solution of zinc-silico-fluoride was applied to the entire inscribed surface and preserved with 1% solution of perspex.

54. BIMALA TEMPLE, PURI, DISTRICT PURL— Removal of tenacious lime plaster from the deplastered surface was continued and completed. Dilute acetic acid was applied to soften the lime accretions and then brushed by chemico-mechanical means. The residual reagents were thoroughly washed from the surface and then fungicidal treatment was given. The entire surface was preserved with polyvinyl acetate in toluene after it was completely dried.

55. LORD JAGANNATHA TEMPLE, PURI, DISTRICT PURL— Chemico-mechanical process to remove the tenacious lime plaster accretions from the deplastered surface of the *vimana* above nineteen metres was continued using dilute acetic acid. Dilute ammonia and teepol solution washing were given to the cleaned surface. Before applying fungicide and preservative coats, the surface was allowed to dry completely.

The entire vertical walls of *garbhagriha* upto a height of thirty feet were subjected to removal of the adamant lime plaster layers mechanically with care. Apart from the walls, the *ratna simhasana,* silver doors and *aavagraha* panel were also cleaned chemically to remove accretionary deposits of soot, oil and greasy matter.

56. LAKSHMI TEMPLE, PURI, DISTRICT PURL— The *nata-mandapa* and *bhoga-mandapa* were subjected to chemical treatment for eradication of layers of dried moss and lichen, etc. by using dilute ammonia solution. Dust and dirt were removed by washing with dilute teepol solution. Before fungicidal and preservative treatments, the entire cleaned surface was allowed to dry completely.

57. VIKRAM KHOL INSCRIPTIONS, BELPHADA, DISTRICT SAMBALPUR.— Inscriptions in the cave situated in a remote and reserve forest were found completely covered with vegetation growth and in a very bad state of preservation due to water seepage. Most of the letters of the inscriptions were eroded and the remaining ones are completely obliterated due to deposits of thick layer of vegetational growth, dust and dirt, soot. Acetic acid and sodium hexametaphosphate were found effective in addition to teepol and ammonia to remove these accretions with the help of cotton swabs. The time of contact was checked frequently at different time intervals till complete removal of accretions. The cleaned surface was finally given fungicidal treatment and preservative coat.

PONDICHERRY

58. TOTADRINATHA TEMPLE, TIRUBHUVANI, DISTRICT PONDICHERRY.— Hard accretions of cement mixed with lime wash and patches of vegetational growth over these exterior walls of the shrine were removed with the help of ammonia and teepol together with acetic acid using physico-chemical methods. Sodium pentachlorophenate was used as fungicide and Acrypol-P-876 in toluene as preservative on the cleaned surface.

RAJASTHAN

59. DEEG PALACE, DEEG, DISTRICT BHARATPUR.— Micro-biological deposits from the marble surface from Suraj Bhawan were removed with ammonia-teepol solution and then subjected to clay pack technique for removal of iron stains, water marks and other superficial accretions. The pH of the clay pack treatment was adjusted with ammonia and hydrogen peroxide to a required value in order to remove the stains. The surface was burnished with soft muslin cloth after thorough washing with distilled water to provide the original lustre. Green patina developed on the brass ring was also treated to remove deleterious salts from it with suitable and selective reagents.

60. MAHISHASURMARDINI TEMPLE, BAROLI, DISTRICT CHITTAURGARH— Hard and thick deposits of lime wash and dried moss and lichens on the exterior of the temple was eradicated by using acetic acid. About 236 sq metre surface area was chemically cleaned.

61. SHRINGAR CHAULI TEMPLE, CHITTAURGARH FORT, DISTRICT CHITTAURGARH.— Eradication of dried micro-biological growth, hard calcarious dust deposition, etc., from the carvings and sculptures was continued by using dilute acetic acid with gentle brushing. The entire chemically treated area was given fungicidal and preservative treatment.

62. SIVA STATUE, CHARCHOMA, DISTRICT KOTA.— Strengthening and consolidation of Siva statue was carried out by using proper formulation of epoxy resin. Micro-biological growth dust, dirt and greasy matter were eradicated. The chemically cleaned surface was preserved with polymethyl methacrylate acetate in toluene.

63. RANTHAMBORE FORT, RANTHAMBORE, DISTRICT SAWAI MADHOPUR.— Chemical treatment and preservation of various arms and weapons of the fort was continued to check further corrosion. Green patina and other corroded products were removed using sodium-potassium tartrate, sodium hydroxide, rustodin, oxalic acid, tartaric acid, etc. A 2% solution of polyvinyl acetate was applied over the cleaned metal surfaces as per requirement.

TAMIL NADU

64. PIRAVADESVARA TEMPLE, KANCHIPURAM, DISTRICT CHENGAI ANNA.— Patches of lime wash, sporadic growths of moss, etc., and enamel paint marks were removed by using 10% acetic acid solution, 3 : 1 mixture of ammonia and teepol and selective organic solvents for enamel paint. A 1% solution of sodium pentachlorophenate was used as fungicide and 3% polyvinyl acetate in toluene was applied to the dried surface as preservative.

65. VAIKUNTHA PERUMAL TEMPLE. KANCHIPURAM, DISTRICT CHENGAI ANNA.— Vegetational growths and lime-wash from the outer walls and pillars of corridor was removed with application of fungicide and preservative Acrypol-P on the entire cleaned surface. The total area covered during the year was about 1778 sq metre.

66. SHORE TEMPLE, MAHABALIPURAM, DISTRICT CHENGAI ANNA.—Paper pulp treatment to extricate the deep rooted soluble salts from this weathered granite structure was continued till the extraction of salts was completed. North and west walls of main shrine and northern *prakara* wall were treated. Filling of cracks and holes with epoxy resin and coarse powder of granite was also attended. The patches of vegetational growth and accumulated dust deposit were removed with ammonia-teepol solution. After thorough washing, fungicidal and preservative treatments were given to the chemically treated area. A total of about 260 sq metre area was completed. The work is in progress.

67. ROCK-CUT SIVA TEMPLE, KUNANDAR KOIL, DISTRICT PUDUKKOTAI.— Accretionary deposits of oil, soot and smoke, etc. were removed by chemical cleaning of sculptures, ceiling and pillars, etc. using selective organic solvents followed by ammonia-teepol mixture treatment. Lime wash from the pillars was removed by treatment with dilute acetic acid solution. The entire cleaned area was preserved with Acrypol-P.

68. SIVA TEMPLE, NIRPALANI, DISTRICT PUDUKKOTTAI.— The unwanted depositions from the *vimana* and walls were re moved effectively by chemical treatment bringing the surface to its originality. The cleaned surface was preserved with Acrypol-P after fungicidal treatment in appropriate concen tration.

69. BRIHADESWARA TEMPLE, GANGAIKONDACHOLAPURAM, DISTRICT TRICHY.—Removal of vegetational growth and lime wash from the stone surface of Kailashnatha and Ganapati shrines was completed by using ammonia, teepol and oxalic acid in desired concentrations. Sodium pentachlorophenate and Acrypol-P were applied as fungicide and preservative coats respectively to the cleaned surfaces. The total surface area treated chemically was approximately 632 sq metre.

UTTAR PRADESH

70. ITMAD-UD-DAULA, AGRA, DISTRICT AGRA.— The chemical treatment work or the removal of dirt, dust, smoke, greasy matter and other superficial accretions from the painted surface in northern verandah and north-west corner room was continued using different organic solvents like cellosolve, benzene, methylated spirit, bulty lactate, triethanolamine, etc. The chemically cleaned surface was given a preservative coat of 1% polyvinyl acetate in toluene.

71. TAJ MAHAL, AGRA, DISTRICT AGRA.— Marble surface of the southern arch and adjacent upper arch (eastern side) was covered with dust, dirt, greasy matters and other accretions. The surface accretions were removed with a modified and improved clay pack treatment and washed with distilled water. The metallic gate of the main mausoleum had developed greenish tinge due to corrosion of copper gilded on the door. The same was restored after removing the corrosion products using alkaline Rochelle salt and other solvents. The work was completed.

Accretionary deposits of dust, dirt and vegetational growths were removed from the marble surface of the dome. The pinnacles above the dome and on adjacent small *burjis* and *chhatris* were treated separately and the yellow golden shine of these metallic pinnacles was restored.

72. SISTER OF PRINCE KHUSHRO'S TOMB, ALLAHABAD, DISTRICT ALLAHABAD.— Moss, lichen, dust and dirt was removed by using sodium pentachlorophenate as fungicide followed by preservative coat of 2% polyvinyl acetate in toluene.

73. JAGESHVAR TEMPLE, ALMORA, DISTRICT ALMORA.— Thick deposits of smoke embeded with local mud plaster coat in the form of accretions were removed from the remaining uncleaned surface of the temple. The thick coat of resinous black soot was removed by treatment with organic solvents like triethanolamine and later on the entire surface was given usual ammonical and teepol mixture treatment. After final cleaning with water, the entire surface was preserved.

74. ASAFI MOSQUE, LUCKNOW, DISTRICT LUCKNOW.— In continuation of the previous year's work, the remaining work for the removal of lime plaster was taken up. The entire surface was preserved with 2 to 3% solution of perspex in toluene after fungicidal treatment.

75. SADAT ALI TOMB, LUCKNOW, DISTRICT LUCKNOW.— Chemical treatment for the removal of moss, lichen growths, dirt and dust was continued from the external surface of the tomb using mixture of ammonia-teepol in aqueous medium. The surface was finally washed thoroughly with water. Fungicide and preservative coats were applied to the chemically cleaned surface.

WEST BENGAL

76. LAL JI TEMPLE, KALNA, DISTRICT BARDHAMAN.— Thick layer of vegetational growth was removed from the surface of the temple by gentle scrubbing with nylon brushes in wet condition using ammonia and teepol mixture. Oxalic acid was used to remove dark patches of other types of growths whereas acetic acid was used to soften lime coats. Finally the fungicidal and preservation treatment was given after drying the surface.

TREATMENT OF EXCAVATED OBJECTS AND MUSEUM EXHIBITS [1]

1. A silken prayer carpet which was displayed in Red Fort Museum was subjected to fumigation with p-dichlorobenzene to combat and arrest the insect activity. After repair and mending work, the fumigation process was repeated.

2. The holy Quran, received from Binapur Museum was in very bad shape. About 50 pages were subjected to de-acidification and brownish stains were removed carefully with 2% FL, O_2 with the help of cotton swabs after protecting the painted surface with 0-5% solution of polyvinyl acetate. The work is in progress.

3. About one hundred lead coins were chemically treated and preserved. The treated coins were preserved for their metallic lustre.

4. One iron fountain of Rani Mahal complex, Golconda fort was chemically treated for removal of acrylic paint and stains of rust and the metallic lustre was restored. It was preserved to prevent further corrosion.

5. Seven lime plaster samples, taken from various locations of Bidar Fort, Bidar were subjected to qualitative analysis for evaluation of their chemical composition.

6. Seven bronzes from Archaeological Museum, Chandragiri were subjected to chemical treatment for removal of siliceous accretionary deposits. The treatment was carried out with carbonate solution and repeated washing with distilled water till the complete removal of chloride ions.

7. Ninety-two stone sculptures displayed in open air at Archaeologcial Museum, Halebid were taken up for chemical treatment by using acqeous solution of non-ionic detergent and dilute ammonia glacial acetic acid for removal of accretionry deposits followed by a fungicidal treatment with sodium pentachlorophenate in acqeous-medium and Acrypol P-878 in toluene.

8. Two photo-albums containing black and white photographs dating back to 1886 onwards, received from Infantry School Library, Mhow was restored.

9. Twenty-two copper coins were chemically treated and preserved after removing the deleterious salts embeded in patina.

10. One copper-plate recieved from Gujarat State Archaeology was chemically treated.

11. Six sculptures and three panel paintings of the Archaeological Museum, Velha Goa were chemically cleaned. The old varnish and other accretions were removed from the wall of the Museum office. The work is in progress.

12. Mural and Canvas paintings and other objects like ivory, palanquin, head-gear, etc. displayed in Mattancherry Palace Museum, Cochin were chemically treated and preserved.

---

[1] Information from: 1 -13, Chemical Branch of the Survey; 14, Department of Archaeology, Government of Gujarat; and 15-18, Department of Archaeology and Museum, Government of Andhra Pradesh.

13. Eighty-four out of ninety-nine silver coins belonging to the period of King George V, Victoria Empress and Edward VII, received from Srinagar Circle of the Survey, were chemically cleaned for the removal of green (copper salts) and blacking grey (silver sulphide) accretions. The coins were finally preserved.

14. Objects like shikkal, fish-hook, copper-coin, terracotta ear-stud, etc., found from excavation at Rojdi, district Rajkot were given chemical treatment and preserved.

15. Copies of paintings of Ajanta and Ellora Caves in the possession of State Museum, Hyderabad were chemically treated and preserved.

16. Stone sculptures displayed at Kolanpak Museum, Nalgonda were preserved.

17. Huge wooden chariot displayed at State Museum, Hyderabad was preserved.

18. Stone sculptures exhibited in Khajana Building Museum, Hyderabad were chemically cleaned and preserved.

RESEARCH AND ANALYSIS '

1. AIR POLLUTION STUDY IN RELATION TO AGRA MONUMENTS.— Monitoring of various gaseous pollutants and particulate matters was continued by the Air Pollution Laboratory, Agra to keep vigil on pollutants level, climatic conditions and their impact on Agra monuments.

(a) *Measurements of Sulphur dioxide Contents.*—Average concentration of sulphur dioxide in ambient atmosphere of Taj had risen upto 26-20/m^3 during summer which is near to the prescribed standard limits of such sensitive zone.

(b) *Measurement of Dust Fall.*— Dust fall measurement was continued in the vicinity of Taj Mahal, Sikandra and Red Fort. Vaslues recorded at Sikandra are on the higher side than the other two monuments. Taj Mahal experienced appreciably low dust pollution during the months of August, October and November and maximum in the month of July.

(c) *Sulphation Rate.*—Regular monitoring of sulphation rate at Taj Mahal and Sikandra showed higher values at Sikandra than at Taj.

(d) *Measurement of Suspended Particulate Matter.*—Finer and very light air borne suspended particulate matter acts as carrier for condensed gaseous pollutants. These transported SPM get settled over the stone surface by impinging and cause soiling of the stone surface. Under favourable climatic conditions, the reactive anions present in the particulate matter may corrode the stone surface in the long run. The maximum concentration of SPM was recorded in the month of June, which was 4-5 times of the standard limit of 100 ug/m^3 prescribed by Central Pollution Control Board for sensitive zones.

(e) *Rain Water Analysis.*—Rain water analysis of early showers is a very useful tool to ascertain the nature and concentration of air brone pollutants. The deleterious salts like sulphates, chlorides, bicarbonates and NO_x were determined quantitatively in the rains observed first or with a different time interval of atleast ten days in order to ascertain the acidity of the environment.

---

[1] Information from: 1 -3, Chemical Branch of the Survey; and 4-10, National Research Laboratory for Conservation of Cultural Property, Lucknow.

2. MONITORING OF AIR POLLUTION LEVEL IN THE AMBIENT AIR IN THE VICINITY OF RED FORT COMPLEX, DELHI.— The structures in the Red Fort Complex especially on the eastern side are exposed to dusty winds and air-borne particulate matter due to heavy vehicular traffic on the ring road, nearby Indraprastha Thermal Power Station. This environmental scenario is responsible for soiling the marble and stone surfaces of these structures. The deposition of soot is also observed. To study the impact of these pollutants, a programme for monitoring the sulphation and dust fall rate was initiated. The studies will be further extended by monitoring SPM by High Volume Sampler to get a clear picture of the pollutants in the ambient air.

3. ANALYTICAL STUDIES AT SCIENCE LABORATORY, DEHRA DUN.— (a) On experimental basis, gloss has been developed on different varieties of marble. Lustre on marble of Taj before and after chemical treatment were measured. The method developed in the laboratory is useful to develop, lustre *in-situ* at places wherever lustre has either been reduced or diminished due to natural or man made weathering processes.

(b) A glazed lime plaster sample from Narnaul was analyzed for its chemical constituents. Experiments were conducted to develope lustre on lime plaster in the laboratory. The studies are in preliminary stage.

(c) A corroded chip of iron rod was taken from the cavity of broken arm of the brass sculpture, received from Jageshwar for restoration and was analyzed before restoring the sculpture.

(d) A stone sample received from Jageshwar was analyzed to ascertain the nature of stone and accretionary deposits.

(e) Geo-chemical studies were carried out for the fading of black stone used in inlay stone work in Itmad-ud-Daula, Sikandra and Taj Mahal, Agra. The presence of greyish accretionary deposit on black stone making it to appear as fading and its removal methods were evaluated and explored in the laboratory.

(f) Physico-chemical studies were continued for soil samples collected from Dholavira excavation.

(g) Soil and contents recovered from within the earthen pot in Burmese temple at Sarnath were analyzed.

(h) *Mercula,* a local clay used in masonry works in Leh, Ladakh was also analyzed for its chemical constituents to study its behaviour.

(i) A pottery sample received from Jakhera (Aligarh) excavations was analyzed for its chemical constituents.

(j) Experiments were continued to search some new chemicals to be used as tree killers.

(k) Samples of lime plaster from Sheesh Mahal, Ram Nagar and Sadar Manzil, Bhopal were analyzed for their chemical composition.

(1) Three samples of perspex and one haematite were received from the Directorate office. Perspex samples were analyzed to compare the suitability in preservation whereas haematite was analyzed quantitatively with special emphasis on iron content from which iron might have been extracted in ancient times.

4. THIPOLY PHOSPHATE METHOD FOR CLEANING OF BRONZE IMAGE.— STP (Thipoly phosphate) method was developed for cleaning of bronze images having the beautiful green or blue-green patina. This was used very successfully in cleaning bronzes particularly from Tamil Nadu and Kerala. Studies were carried out using infra-red spectroscopy and X-ray diffraction technique and it is no way brings untoward change to the beautiful patina.

5. STABILIZATION OF THE 'BRONZE DISEASE-ZINC DUST' METHOD.— This method was developed as an improved technique in the control of bronze disease in the object of copper and its alloys. The method was successfully tested on the south Indian bronzes. It was found to be of much use even in high humid condition which lead to out break of bronze disease.

6. IRON EXCHANGE RESINS FOR EXTRACTION OF CHLORIDES FROM OBJECTS.— The most of iron objects are contaminated with potentially injurious chlorides ions. If it is not removed, the objects may either crack or split on coming in contact without side environment Preliminary studies indicated that union exchange resin can remove chlorides from iron objects. Laboratory studies are in progress to assess the efficacy and usefulness of union exchange resin in removing chlorides from iron objects.

7. CONSERVATION OF WALL PAINTING OF THICKSAY MONASTERY, LEH (LADAKH).—The wall paintings were taken up for their conservation and about 21 m painted surface area was consolidated, cleaned and reintegrated.

8. ERADICATION OF ALGAE FROM STONE MONUMENTS.— (i) Isolation of unialgal cultures from the samples collected from south Indian monuments was taken up and is in progress; (ii) Attempts were made to grow two algae, one green, one blue-green on some laboratory made mortar sample; (iii) Three chemicals, sodium penta-chlorophenol, aluminium silico-fluoride and borax were tested on these two algae in the agar medium in Laboratory; (iv) Collection of algal sample was done from some brick and lime structures of Lucknow; (v) Isolation of unialgal cultures from these collected samples are in progress.

9. STUDIES ON WATER ABSORPTION BY CAPILLARY ACTION.—Water absorption by total immersion rate of water evaporation, water vapour permeability in Mirzapur sandstone were done. All these parameters are being studied for the samples tested with different polymers like silane, tegavakon H_2100, poly vinyl acetate, polymethyl methcrylate.

10. TECHNO-HISTORICAL STUDIES ON COINS OF KAUSAMBI.— About two hundred coins were selected for study of corrosion products of these coins and destructive analysis of some coins were completed last year. Further to this, one hundred coins were selected for non-destructive analysis and conservation treatments in this year. Physical and optical microscope examinations, qualitative and quantitative elemental investigation Dy X-ray floroscence (XRF) and EDAX. Metalographic examination and mapping of metal conservation corrosion products distribution by scanning electron microscope (SEM) on all these coins are in process.

XII. ARCHAEOLOGICAL GARDENS[1]

ANDHRA PRADESH

1. HILLTOP GARDEN, NAGARJUNAKONDA, DISTRICT GUNTUR.— The irrigation system in the garden was improved by using old pipelines to lift the water from Sagar. The proposal for environmental development at Nagarjunakonda University complex at Anupur was taken up.

JAMMU AND KASHMIR

2. FORT, RAMNAGAR, DISTRICT UDHAMPUR.— A small garden was developed in the fort complex.

3. PALACE, RAMNAGAR, DISTRICT UDHAMPUR.—Small garden was developed in the palace complex during the year under review.

KARNATAKA

4. ROYAL ENCLOSURE, HAMPI, DISTRICT BELLARY.— The water supply system was improved.

5. DURGA TEMPLE, AIHOLE, DISTRICT BIJAPUR.—With the improvement of water works system, the layout of the garden was re-oriented.

6. GOLGUMBAD, BIJAPUR, DISTRICT BIJAPUR.— The water supply arrangements was made.

7. MALLIKARJUNA TEMPLE, PATTADAKAL, DISTRICT BIJAPUR.— The garden in the temple complex was developed with periodic flora by adding coconut palm trees.

8. KESHAVA TEMPLE, SOMNATHPUR, DISTRICT MYSORE.—During the period under review, the water supply system was improved.

ORISSA

9. CAVES, UDAYGIRI AND KHANDAGIRI, DISTRICT CUTTACK.— The work of boring deep tubewell by the Central Ground Water Board was finalized.

10. BRAHMESHVAR TEMPLE, BHUBANESWAR, DISTRICT PURL— The work of environmental develop ment of the temple was taken up.

11. RAJA RANI TEMPLE, BHUBANESWAR, DISTRICT PURL—The lawns of the temple was returfed and the main road leading to the temple was planted with *alstonia scholaris*.

---

[1] Information from Horticulture Branch of the Survey.

UTTAR PRADESH

12. FORT, AGRA, DISTRICT AGRA.— The area of the Meena Bazar Complex was developed into a garden.

13. TAJ MAHAL, AGRA, DISTRICT AGRA.— The augmentation of water at Idgah garden was completed by shallow boring of well.

14. ROMAN CATHOLIC CEMETERY, AGRA, DISTRICT AGRA.— A shallow hand boring of 25 m deep well was taken up during the year under review.

15. GROUP OF MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA.— Irrigation system was improved by boring two rock borewells of more than eighty metre deep and boring of third one is in progress.

16. AKBAR'S TOMB, SIKANDRA, DISTRICT AGRA.—The newly acquired area in the eastern side of the tomb was cleared off rank vegetation and, PVC pipe-lines for irrigation purposes were laid, Chainlink fencing with hedge and shrubbery border was completed.

17. SIKANDRA BAGH, LUCKNOW, DISTRICT LUCKNOW.— Development of garden around the main gate was completed.

WEST BENGAL

18. DAKHIL DARWAZA, GAUR, DISTRICT MALDA.—The work of environmental development of the area around the monument was taken up.

19. FIROZ MINAR, GAUR, DISTRICT MALDA.— The work of environmental development around the monument was taken up.

20. CHAMKATI MOSQUE, GAUR, DISTRICT MALDA.—The work of environmental development of the land around the mosque was taken up.

21. TANTIPARA MOSQUE, GAUR, DISTRICT MALDA.—The work of environmental development of the area was taken up.

22. QUTB SHAHI MOSQUE, MALDA, DISTRICT MALDA.— The work of environmental development of the area around the mosque was taken up.

XIII. PUBLICATIONS

PUBLICATIONS OF THE SURVEY

1. INDIAN ARCHAEOLOGY-A REVIEW.— The issue for the year 1987-88 was brought out and the issue for the year 1988-89 was sent to press for printing. Four issues for the years 1954-55,1955-56, 1956-57 and 1957-58 were reprinted.

2. MEMOIRS OF THE ARCHAEOLOGICAL SURVEY OF INDIA.— No. 88, *Excavations at Sringaverapura (1977-86)* by B.B. Lai was published and two numbers, 89, *Excavations at Bhagwanpura* by Jagat Pati Joshi and 90, *Excavations at Kaveripattinam* by K. V. Soundara Rajan were in advance stage of printing.

3. ARCHITECTURAL SURVEY SERIES.—Number 6, *Temples of Gangas of Karnataka* by I.K. Sarma was published and number 1, *Cave Temples of the Pallavas* by K.R. Srinivasan was reprinted.

4. SOUTH INDIAN INSCRIPTIONS.— Part III of Volume II was reprinted.

5. EPIGRAPHIA INDICA.—Volume XLII (1977-78) was brought out and XLIII (1979-80) is in press.

6. ANNUAL REPORT OF INDIAN EPIGRAPHY.—The issue for the year 1979-80 was published and for the year 1981-82 is in advance stage of printing.

7. GUIDE BOOKS.— *Bishnupur* by S. S. Biswas was printed. *Ajanta* by Debala Mitra; *Amaravati* by H. Sarkar and S .P. Nainar, *Mahabalipuram* by C. Sivaramamurti; *Chola Temples* by C. Sivaramamurti; *Sanchi* by Dabala Mitra; *Hampi* by-D. Devakunjari; *Konarak* by Debala Mitra; *Fatehpur Sikri* by S .A. Abbas Rizvi; *Monuments of Kerala* by H. Sarkar; *Ahmedabad* by K. V. Soundara Rajan; *Mandu* by D.R. Patil, both Hindi and English; *Sarnath* by V.S. Agrawal both Hindi and English; *Udayagiri and Khandagiri* by Debala Mitra; *Pandrethan, Avantipur and Martand* by Debala Mitra were revised and reprinted.

OTHER PUBLICATIONS

ANDHRA PRADESH.— The Department of Archaeology and Museums, Government of Andhra Pradesh brought out *Thotlakonda (A Buddhist Site in Visakhapatnam); Directory of Monuments in Andhra Pradesh* (Anantapur District), Part I and *Religion in Andhra* (reprint).

GUJARAT.— The Department of Archaeology, Government of Gujarat published *Rakshit Smarak Suchi* in Gujarati and 'Visod an Archaeological Site' in *Samipya,* Journal of April 1991-March 1992.

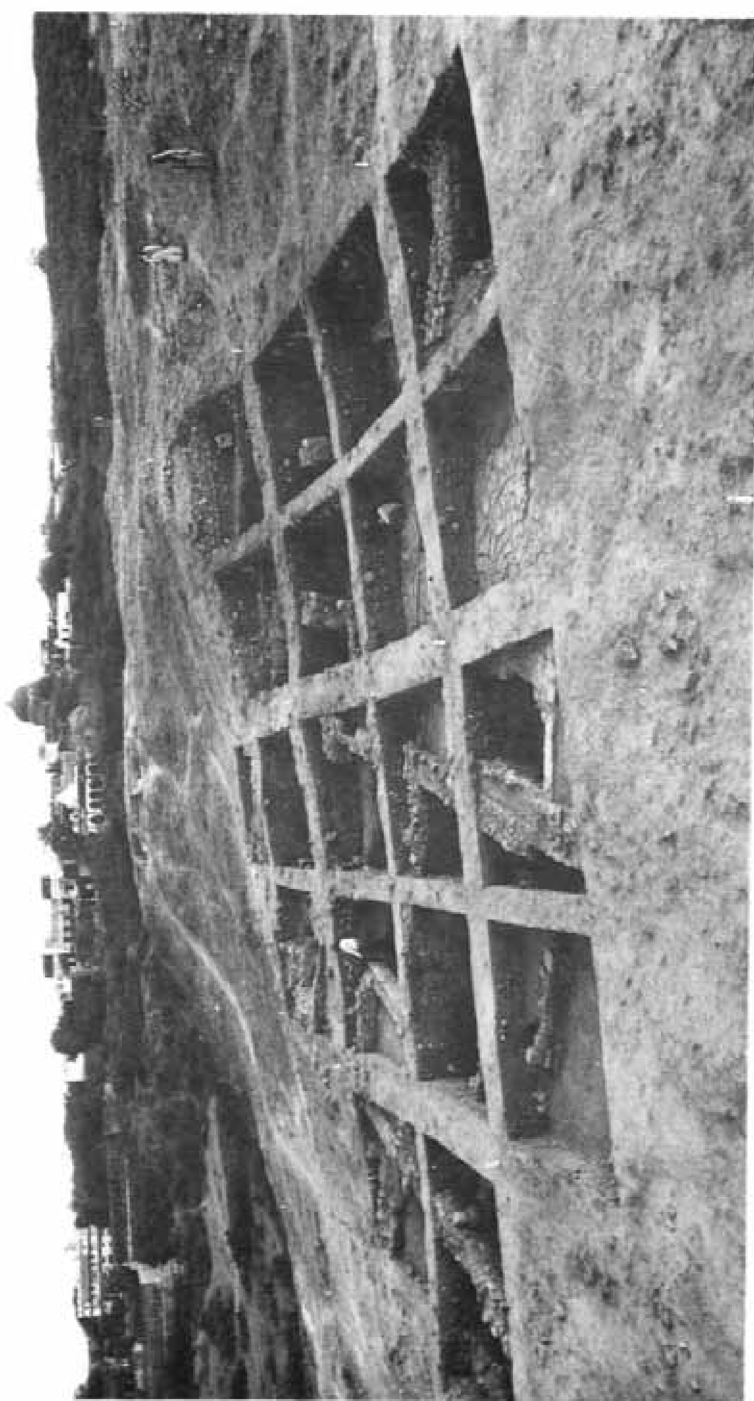


B

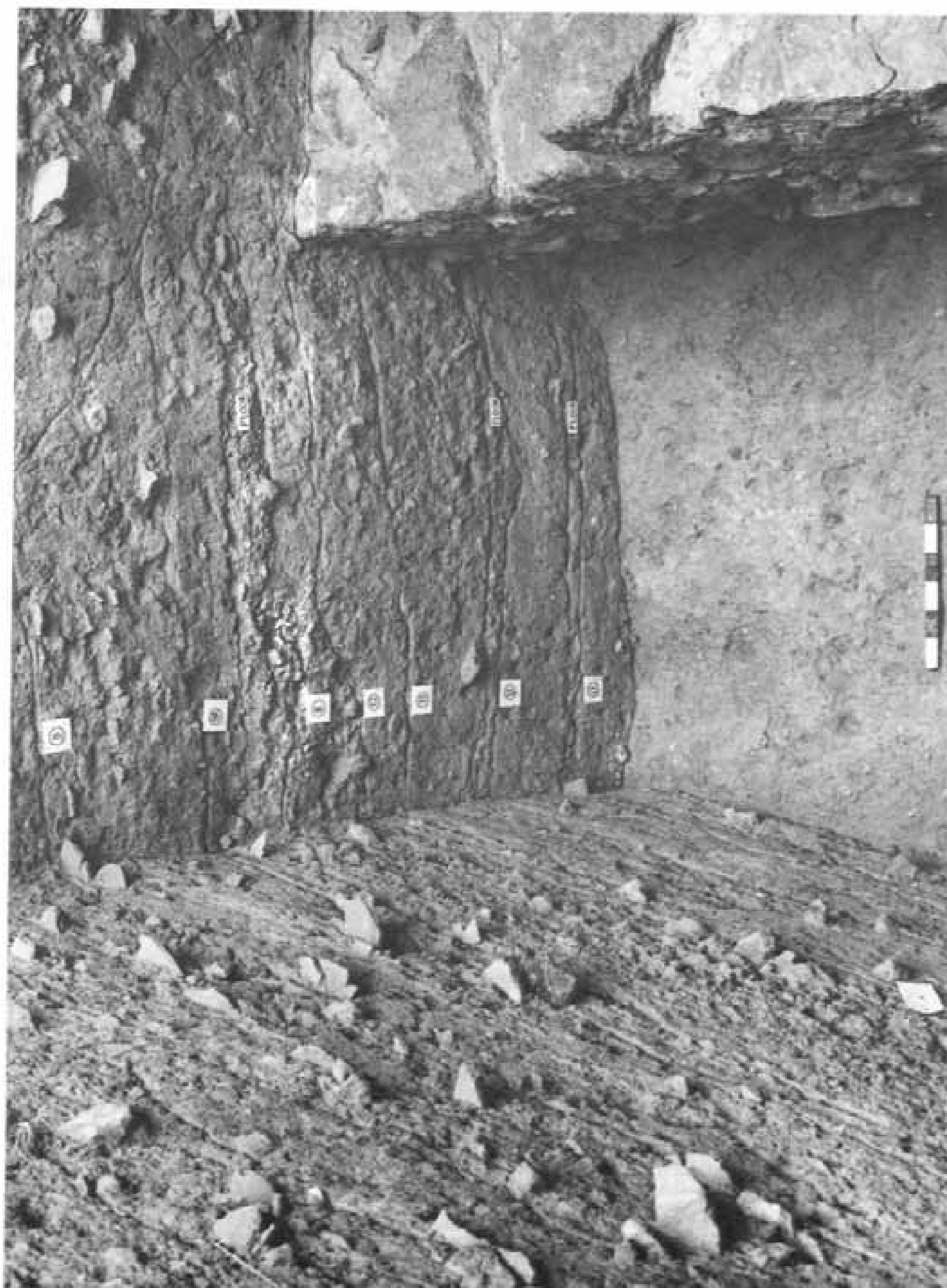


A

Kolhua : view of the exposed brick tank. *See p. 6*



Lal Kot : view of the trenches. *See p. 7*



Lal Kot : section facing east, ZC 1, Qd. 2. See p. 7



A

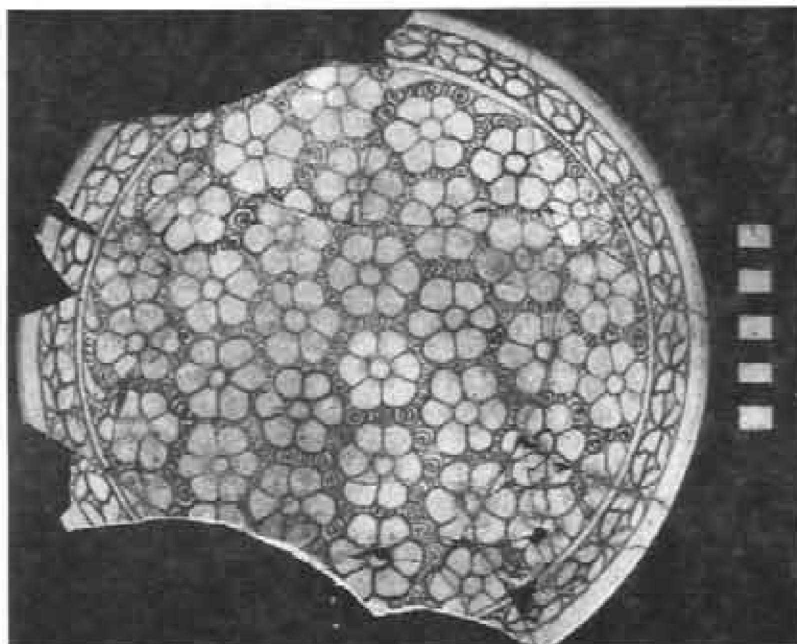


B



C

Lal Kot : A-B, *terracotta coin mould and* C, *stone head of lion.* *See p. 9*



B



A

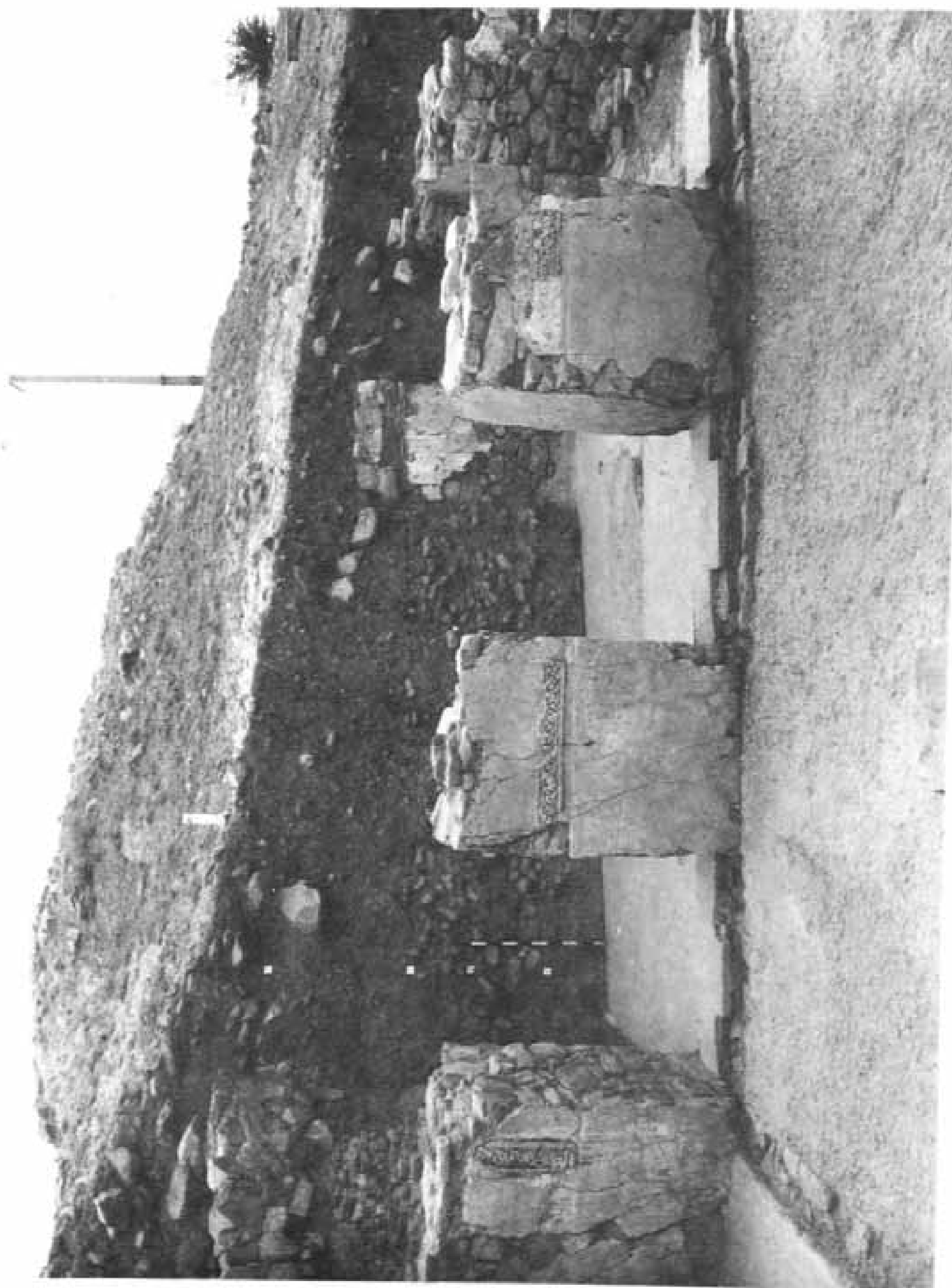
Lal Kot : A, *stone mithuna figures*; B, *glazed broken dish.* *See pp. 9 and 12*



Lal Kot : exposed palace complex. *See p. 9*



Lal Kot : lotus shaped water cistern. *See p. 9*



Lal Kot : floral bands in stucco, palace complex. *See p. 9*



A



B

Lal Kot : terracotta human figurines. See p. 13

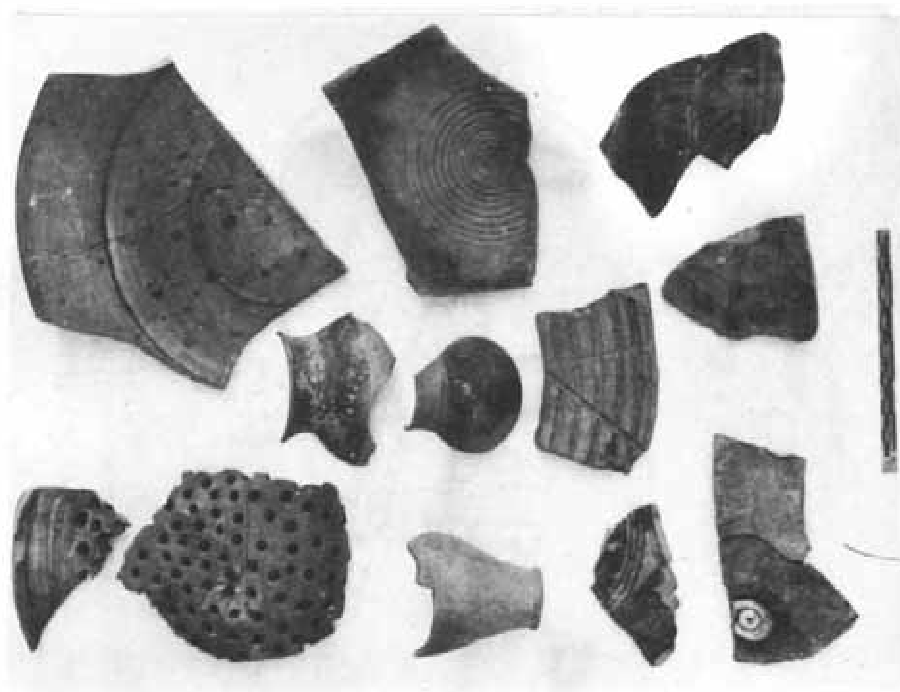


A



B

Lal Kot : A, retaining wall and B, landing of platform, of Anang Tal. *See p. 13*



B



A

Balu : A, exposed fire-places and B, *pottery, Harappan phase. See pp. 35-36*



B



A

Hunder : rock-cut sculptures. See p. 36



A

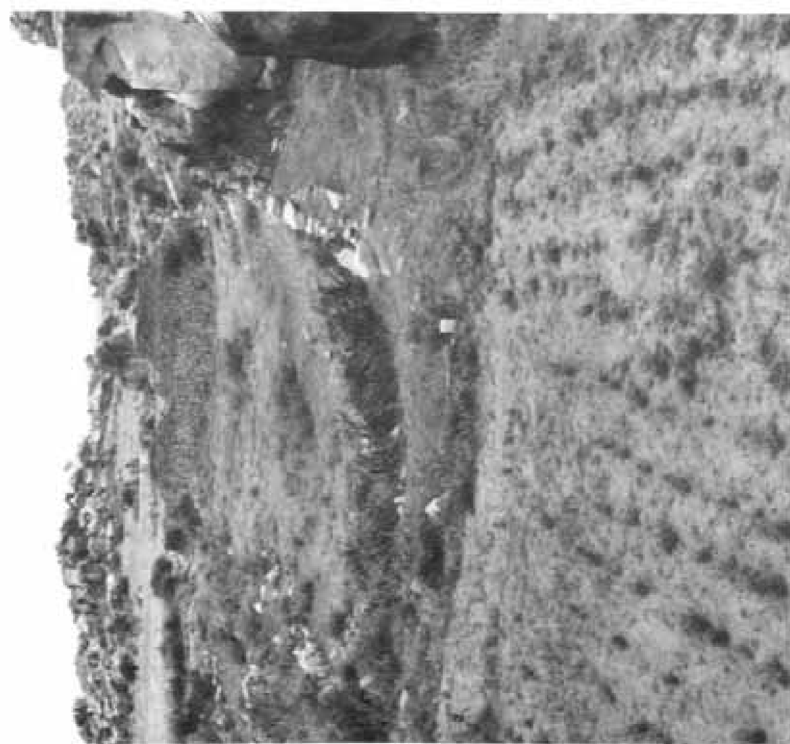


B

Rock carvings : A, *from Sumur and* B, *from Tirath.* *See p. 37*



B

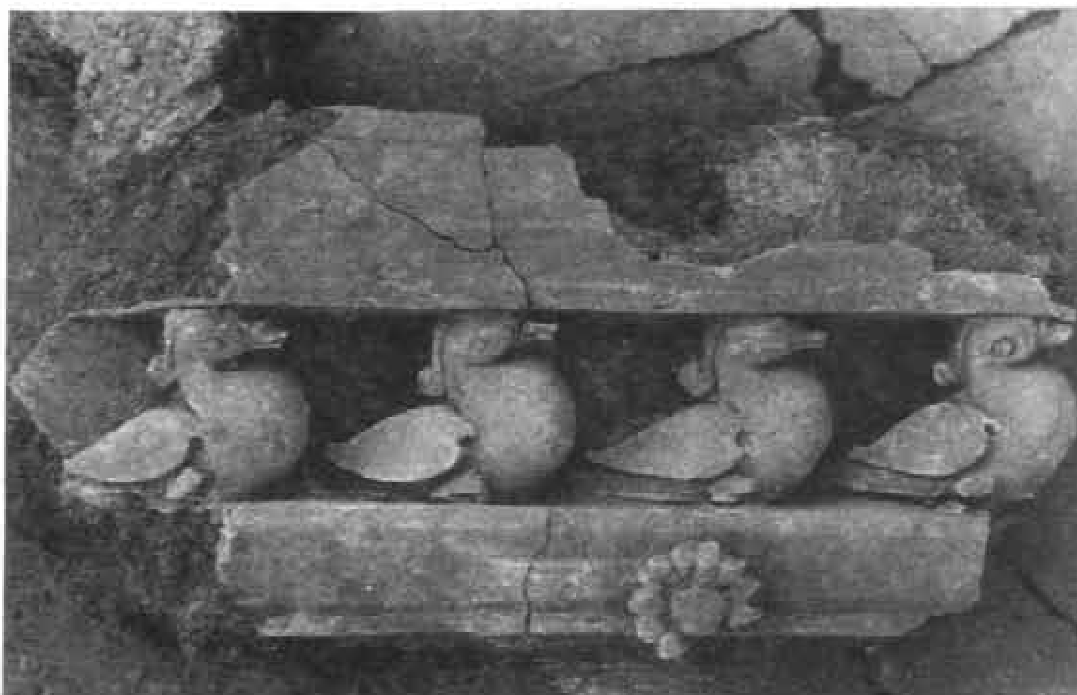


A

Hampi : A, *before and* B, *after excavation in the Rock-cut temple area.* *See p. 38*



Hampi : stucco human figurine. See p. 41



A



B

Hampi : A, *stucco birds and* B, *floral and pendant motifs. See p. 41*



A



B

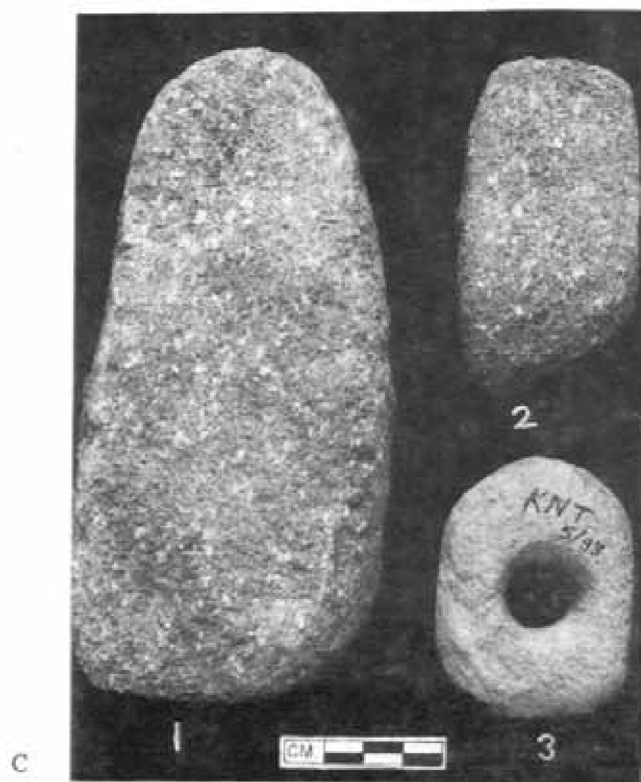
Talkad : terracotta ring-wells. *See p.46*



A



B



C

Talkad : A, *terracotta coin mould and* B, *stone image of Mahishamardini*
C, *Nilakod and Kumta : neolithic tools. See pp.46-47*



A



B

A, *Sisala : dolmen*; B, *Bhawar : exposed section. See pp. 55 and 61*

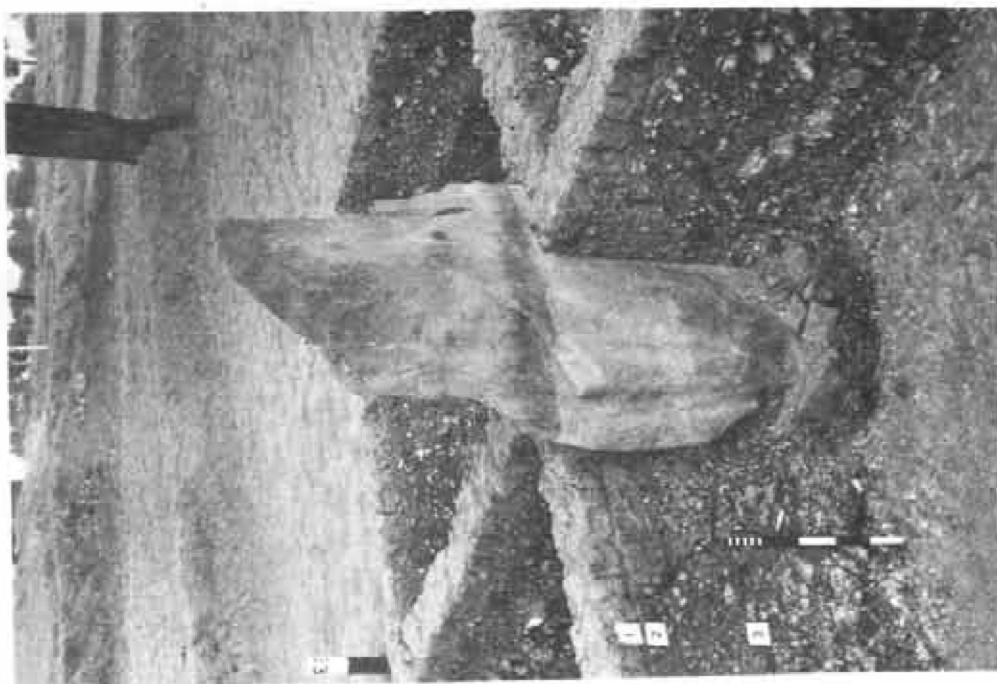


A



B

Pachkheri : A, *microliths and* B, *decorated rim of a jar. See pp. 67 and 70*



B



A

Pachkheri : A, cutting showing part of the section ; B, menhir in-situ. *See pp. 67 and 71*

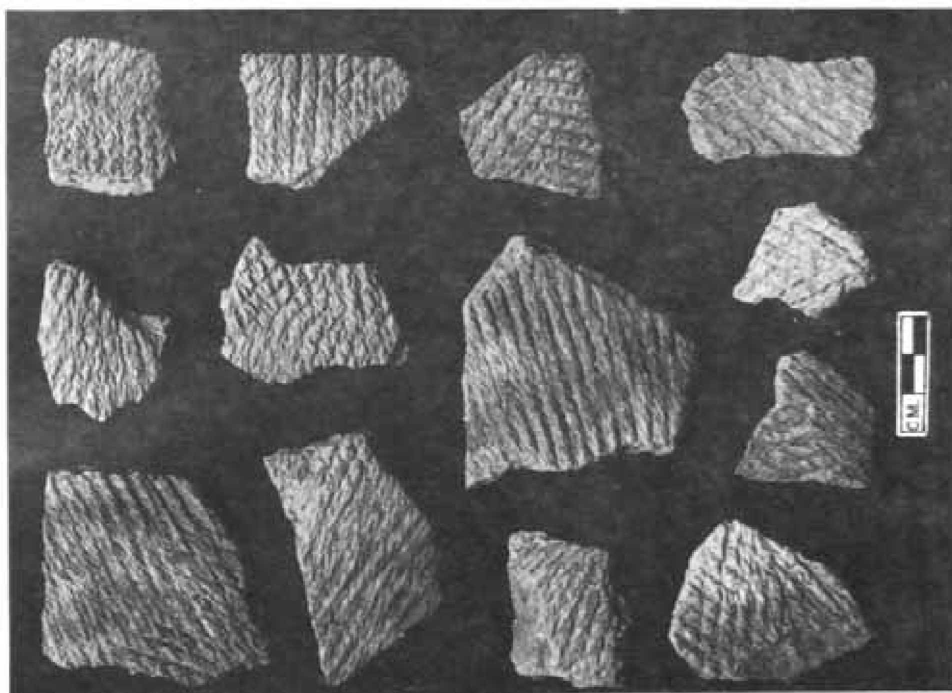


A

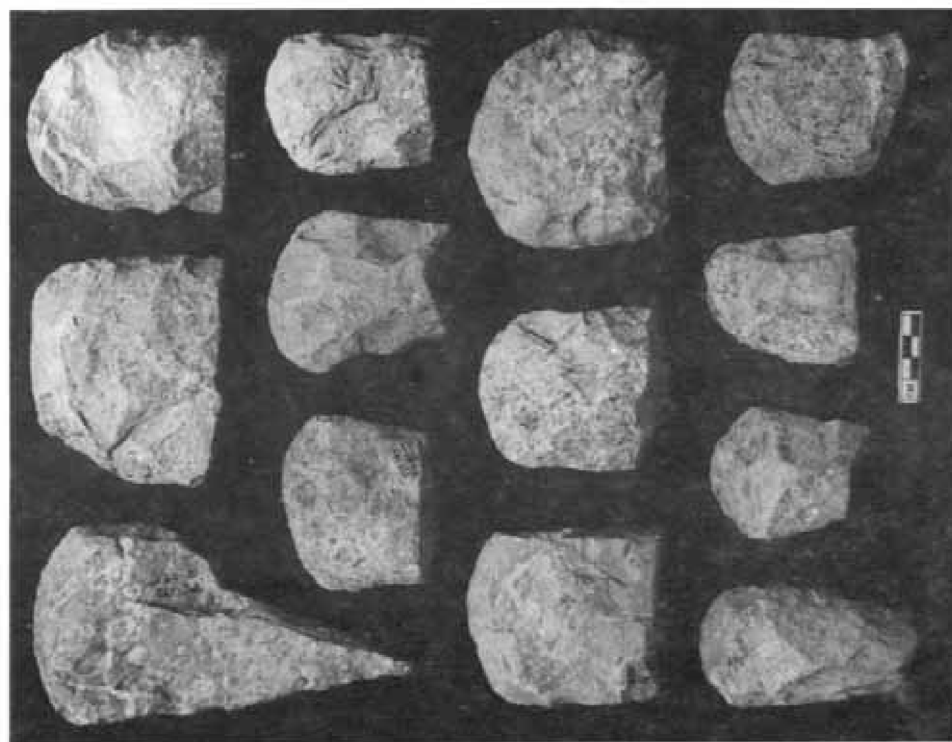


B

Pachkheri : A, *cuttings showing menhir* 1 *to* 4 ; B, *pit-circle with cairn, Period II. See pp. 70-71*

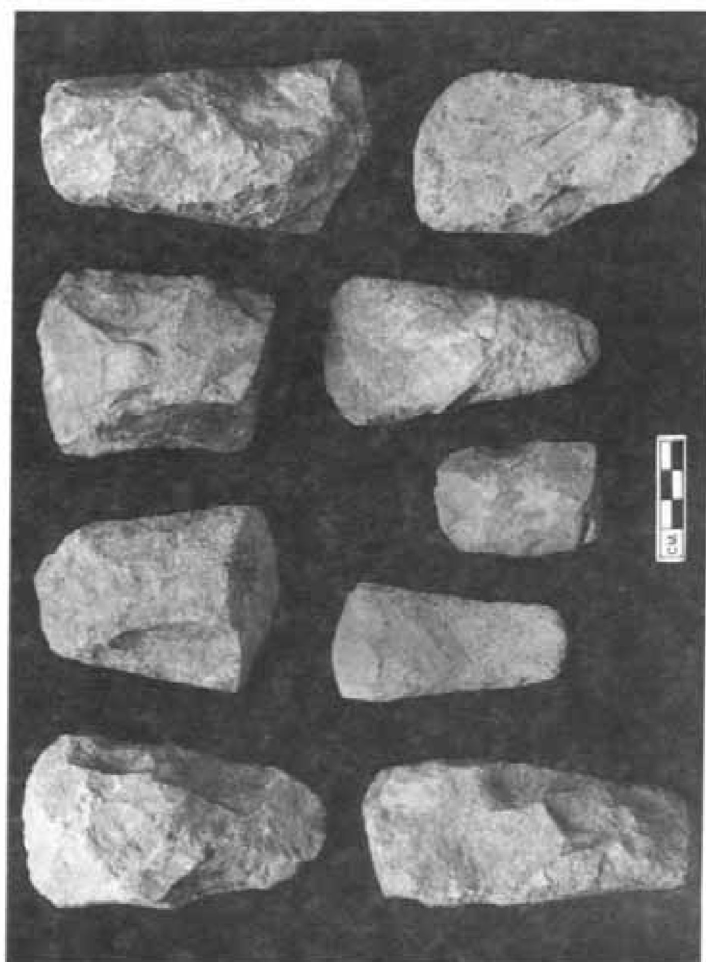


B

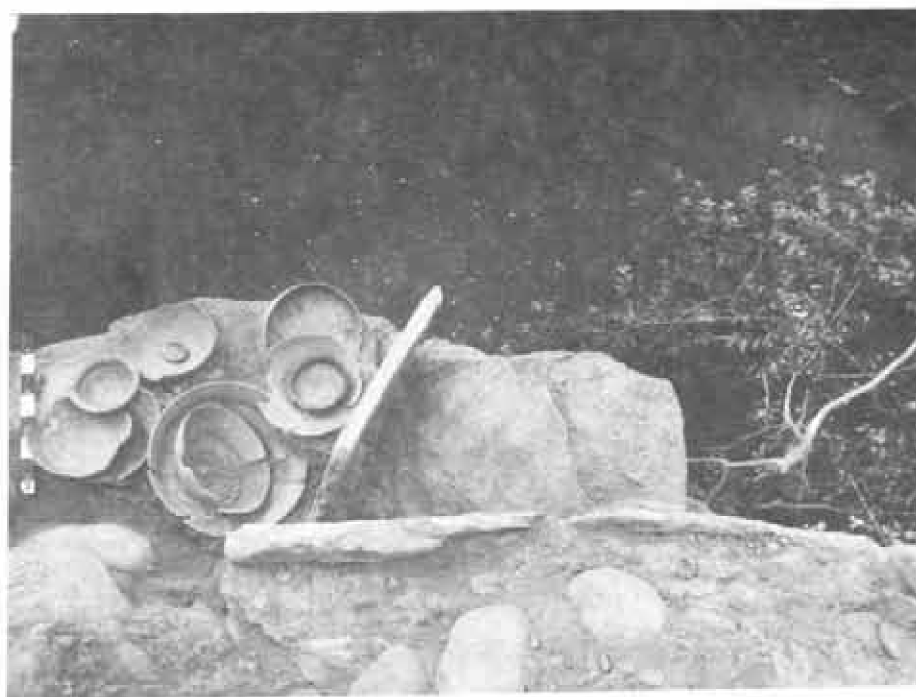


A

Pynhorlangtein : A, *neolithic adzes* ; B, *potsherds with cord impression.* *See p. 75*



Pynthorlangtein : neolithic axes. *See p. 75*



A



B

Baseri : A, *cist-burial and* B, *urn-burials.* *See p. 90*



Pattar Khola : cist-burial. *See p. 91*



A

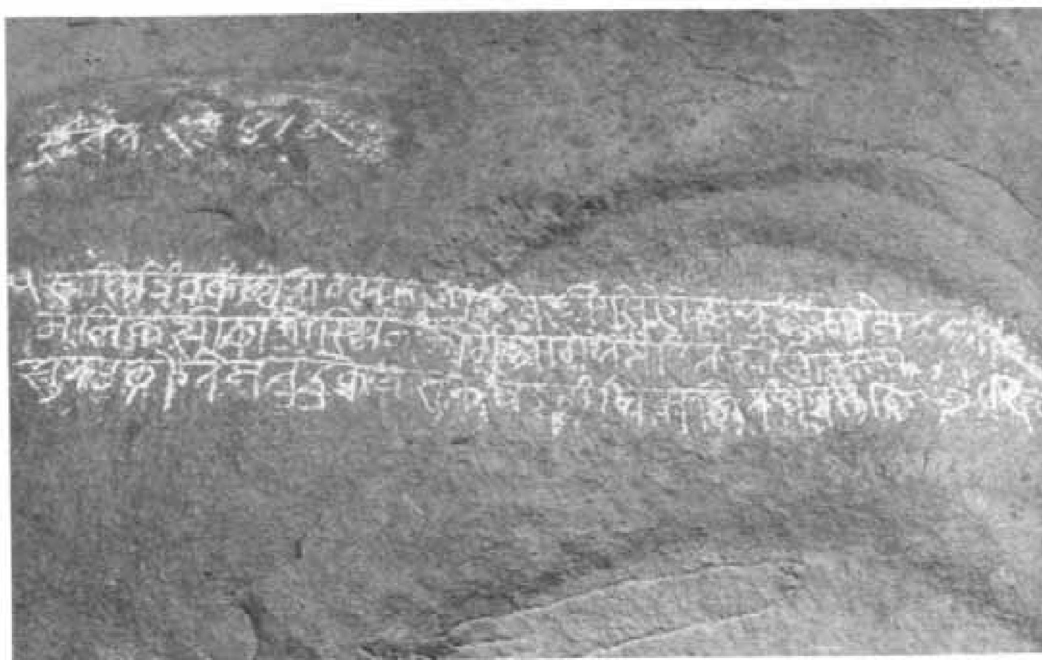


B

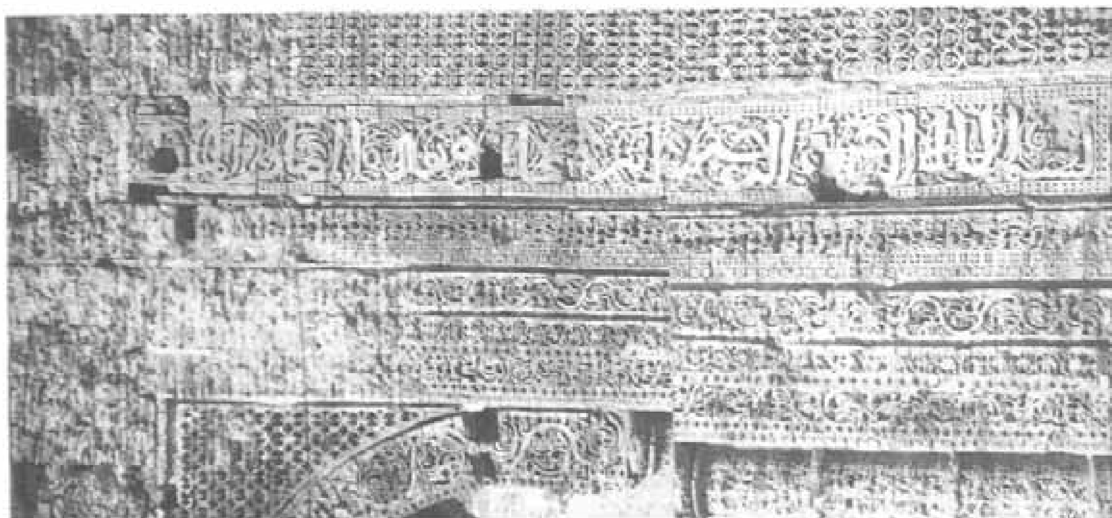


C

Saidhara : votive inscriptions. *See p. 103*

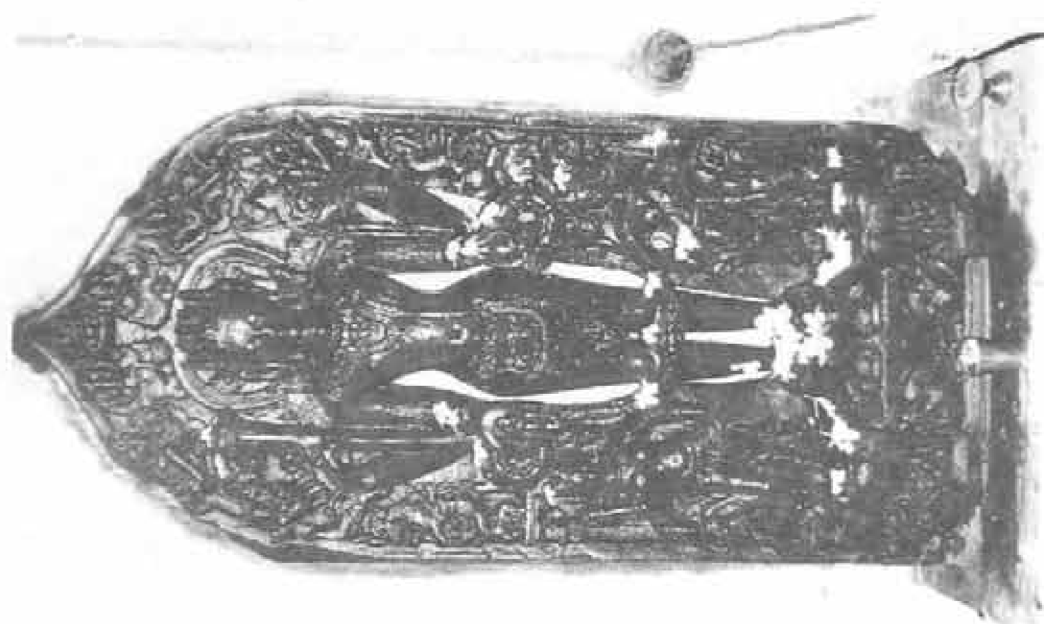


A

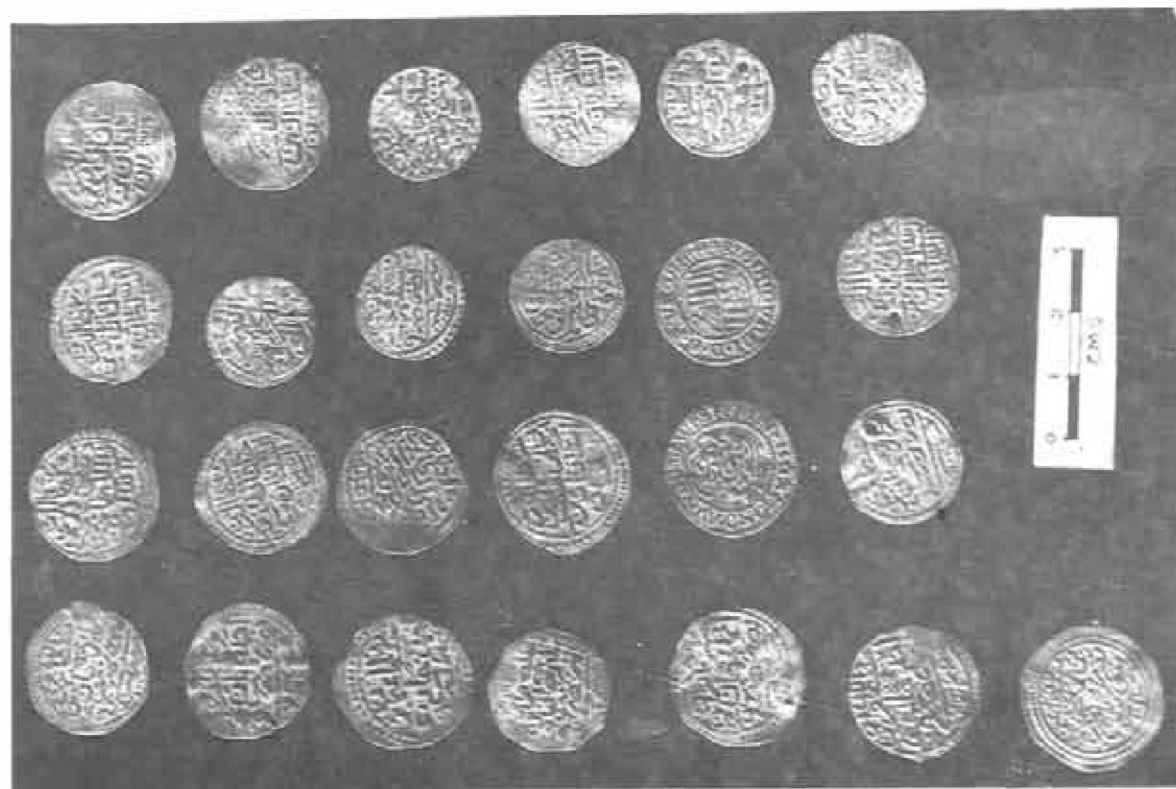


B

A, *Berhat : Devanagari inscriptions* ; B, *Meerut : inscriptions of Mamluk period.* *See pp. 103 and 107*



B



A

A, *Jamnagar* : *gold coins*; B, *Hilli Thana* : *Vishnu. See pp. 109-110*



B



A

Kondarapadu : A, *Mahishamardini* and B, *Panchamukha naga*. *See p. 111*



A



B

A, *Katapur* : *Lower and Middle Palaeolithic tools*; B, *Hooli* : *Andhasura temple, inscribed makara-torana.* See p. 112



Sadhara : Vedika pillars with decorative medallions, *See p. 114*



B

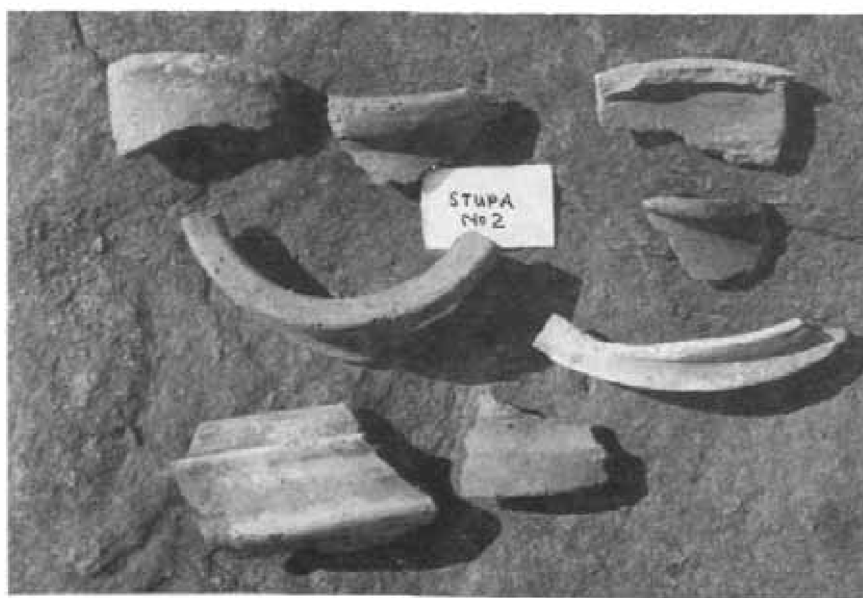


A

A, Satdhara : painted inscriptions on rock; B, Vishnu. *See pp. 114-115*



A



B

Berhat : potsherds. See p. 114



A

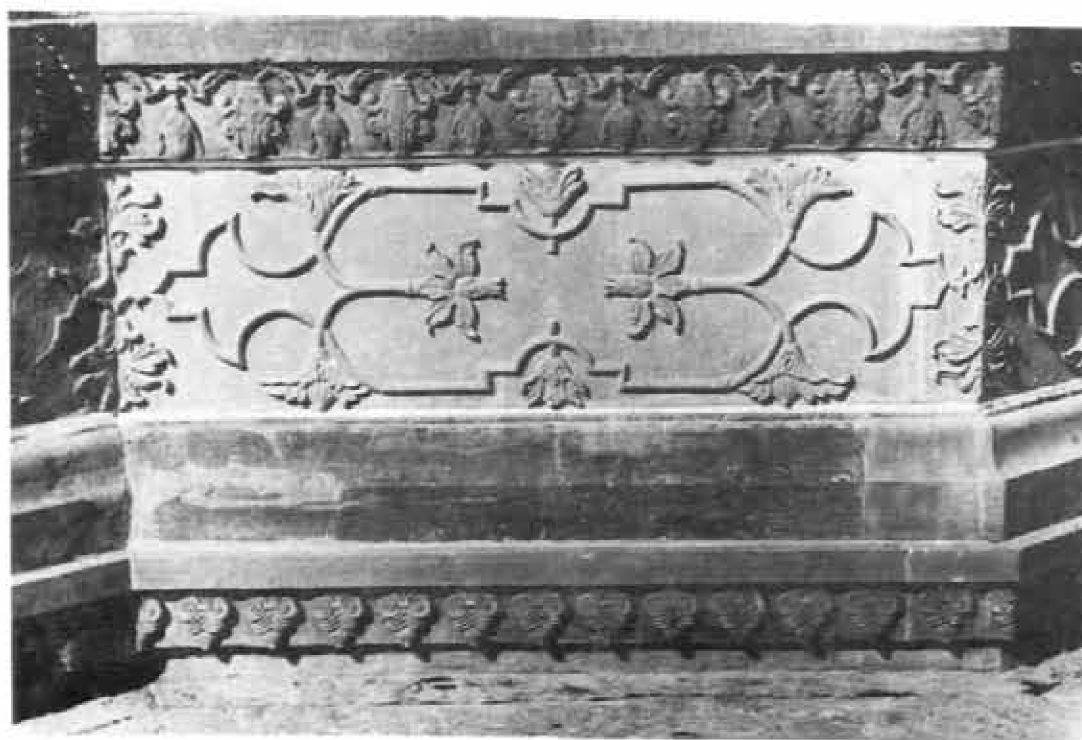


B

A, *view of Pathan Qila and* B, *Dhoolkot : Maharaja Bagh. See pp. 141 and 146*



A

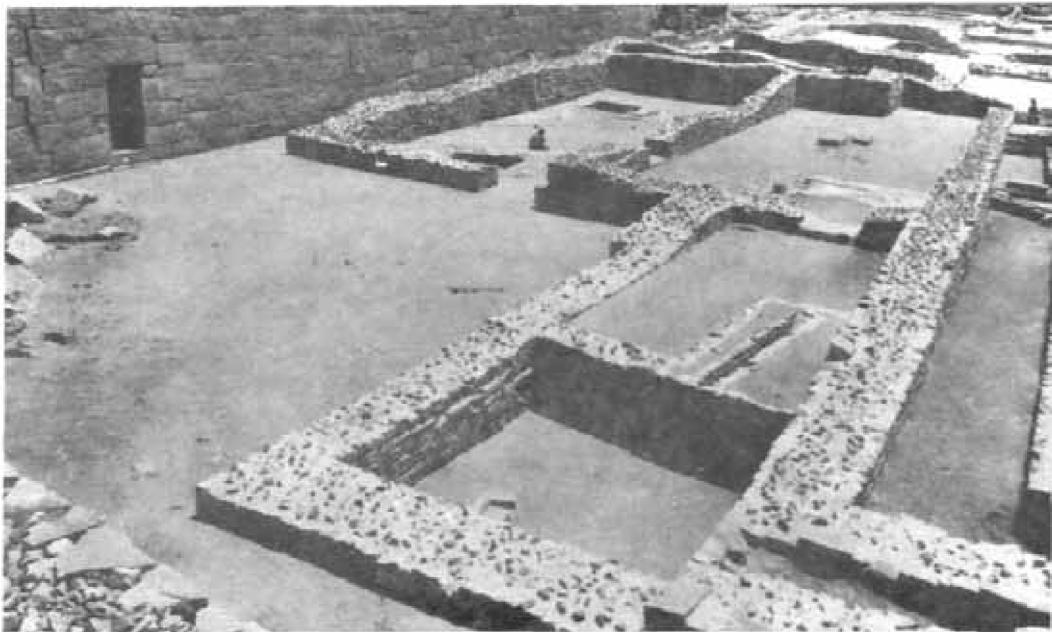


B

Agra : Taj Mahal, maingate, A, *before and* B, *after conservation of decayed veneering stones and mouldings at plinth level.* *See p. 147*



A



B

Hampi : mint area, A, *before and* B, *after conservation. See p. 149*

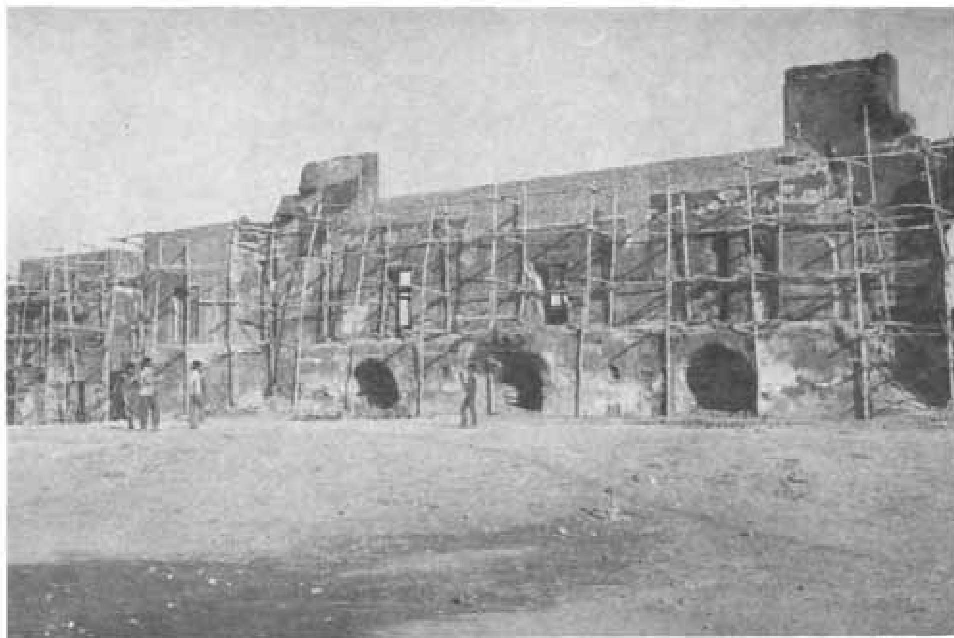


A

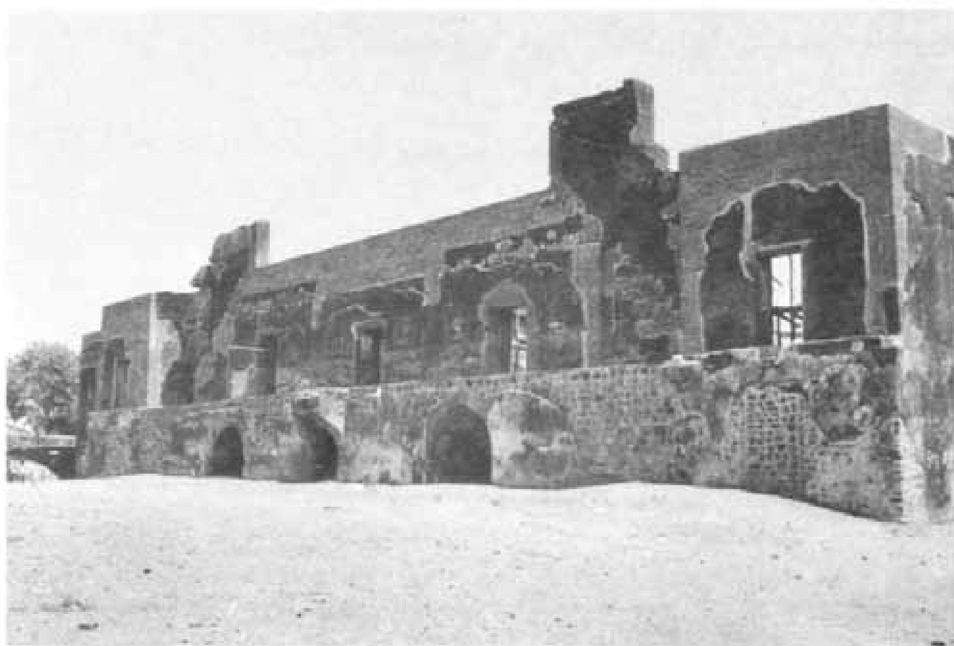


B

Udri : Jaina temple. A, *before and* B, *after conservation. See p. 153*



A

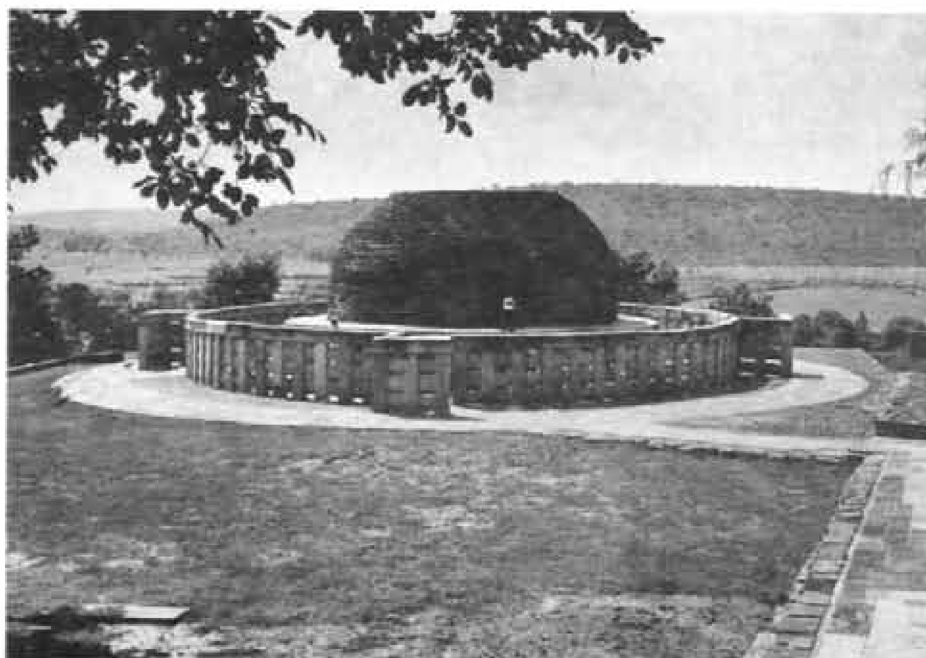


B

Burhanpur : Shahi palace, A, *during and* B, *after conservation.* *See p. 156*



A



B

Sanchi : *Stupa* 2, A, *before and* B, *after repairs to the pathways.* *See p. 156*



A



B

Satdhara : *Stupa*, A, *before and* B, *during conservation.* *See p. 156*



A



B

Terhi : Maujmata temple, A, *before and* B, *after repairs of the torana.* *See p. 157*



A

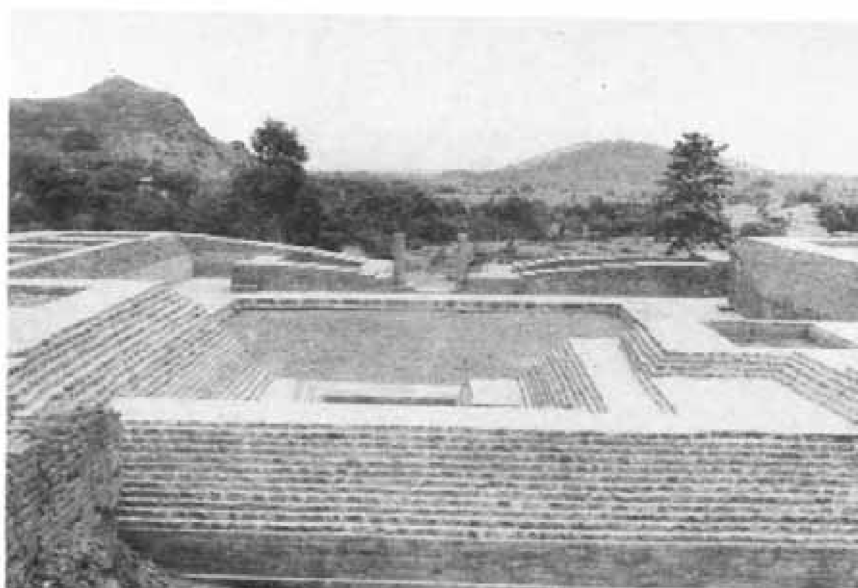


B

Tumain : *Siva temple*, A, *before* and B, *after conservation. See p. 158*



A



B

Lalitagiri : *Monastery* 1, A, *before and* B, *after restoration. See p. 158*



A



B

Lalitagiri : *Monastery* 3, A, *during and* B, *after restoration. See p. 158*



A



B

Udayagiri : Stupa, A, before and B, after restoration. *See p. 158*



A



B

Udayagiri : *Monastery*, A, *before and* B, *after restoration of cells. See p. 158*



A



B

Bhubaneswar : Lingaraja temple complex, during conservation of amala of Siva temple. *See p. 159*

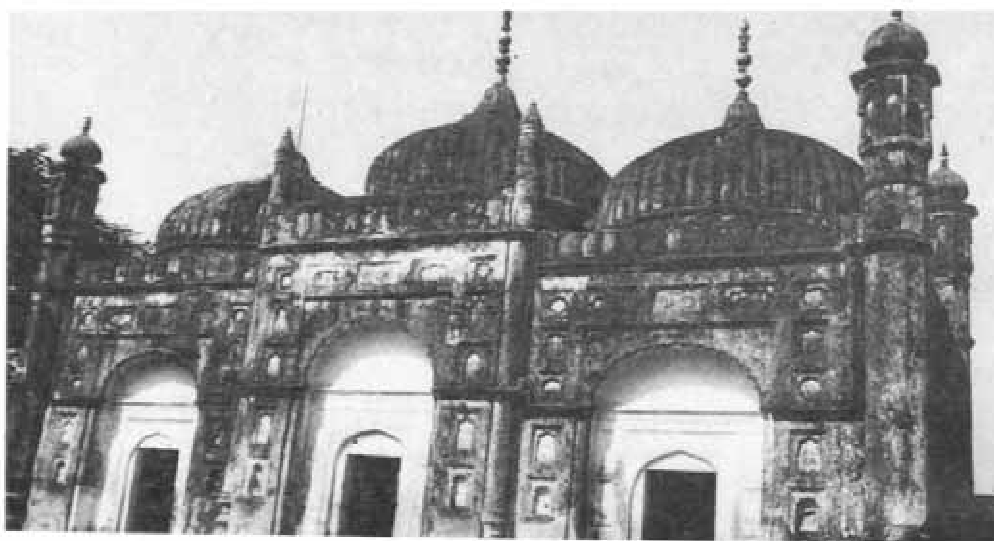


A



B

Malda : Adina mosque, A, *before and* B, *after repairs of cells.* *See p. 160*

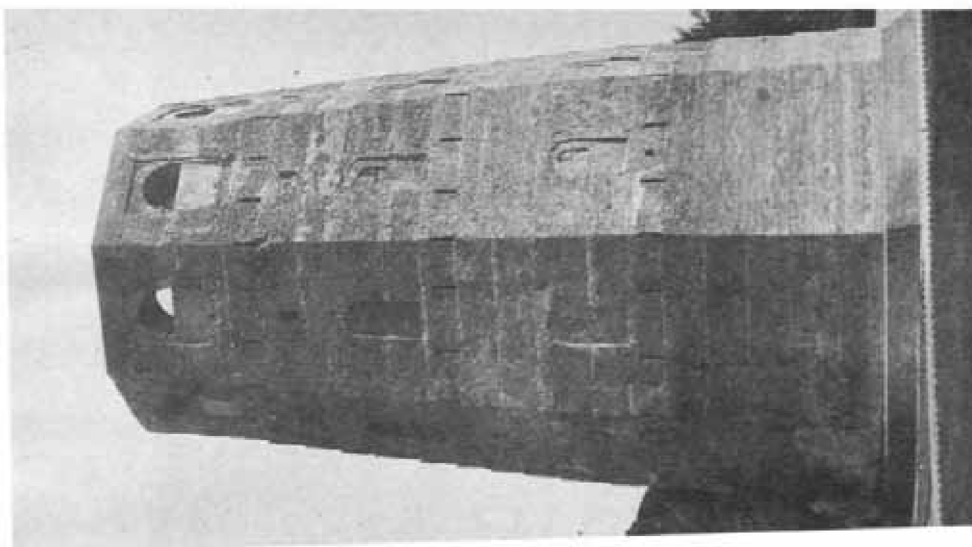


A

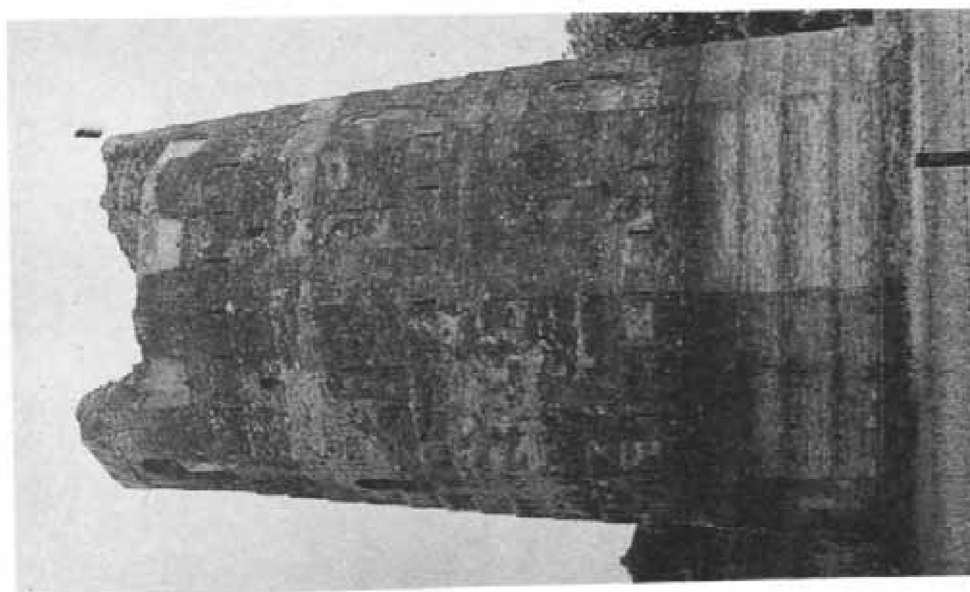


B

Khosbag : A, *before and* B, *after repairs of mosque.* *See p. 161*



B



A

Katra : A, *before* and B, *after conservation of minar. See p. 161*



A



B

Agroha : *Ancient stupa*, A, *before* and B, *after restoration. See p. 161*



A



B

Panipat : Ibrahim Lodhi's tomb, A, *before and* B, *after conservation.* *See p. 162*



A



B

Thanesar : Harsh-ka-Tila, A, *before and* B, *after restoration of the excavated structures.* *See p. 161*

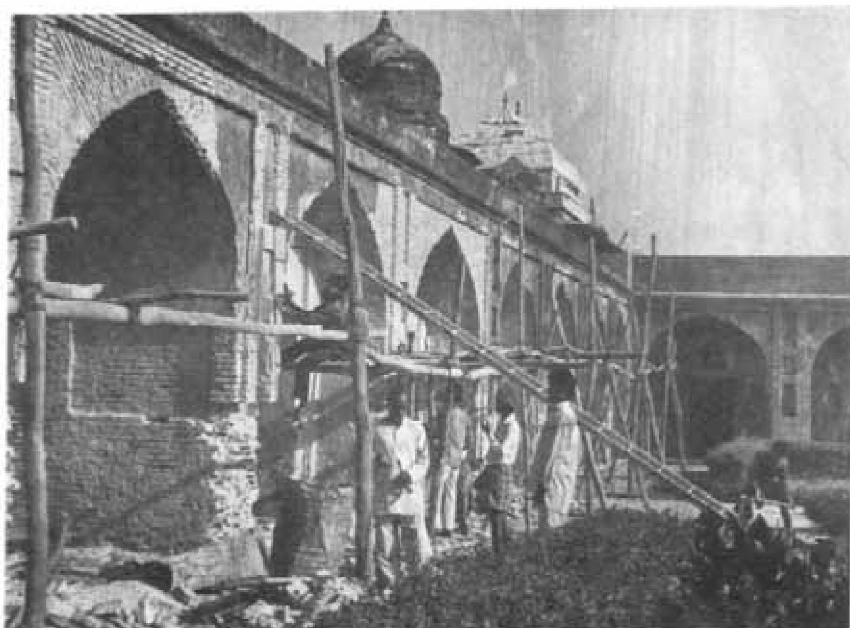


A



B

Thanesar : Shaikh Chilli's tomb, A, *during and* B, *after repairs of cells.* *See p. 162*



A



B

Thanesar : Shaikh Chilli's tomb, A, *during and* B, *after repairs of the cells.* *See p. 162*

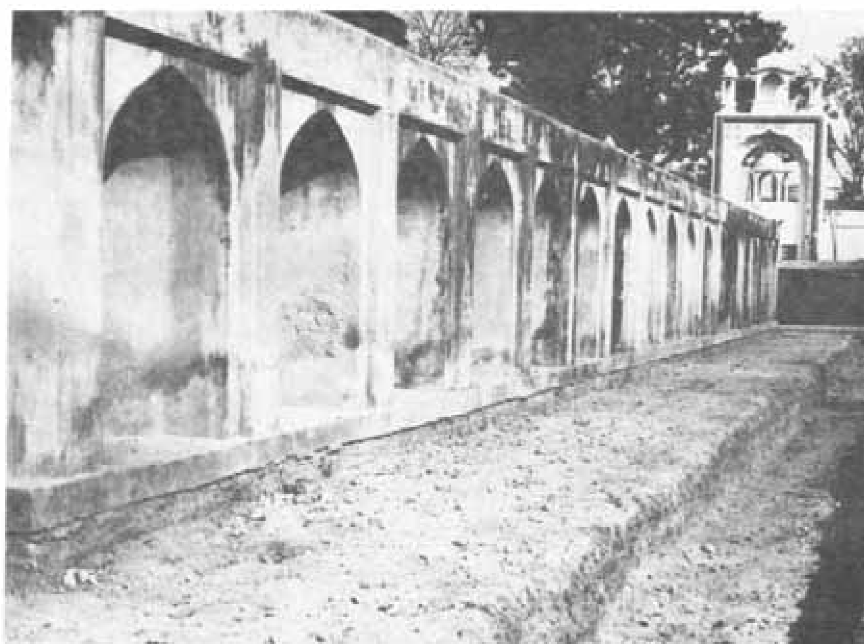


A



B

Mehm : Shah Jahan ki baoli, A, *before and* B, *after conservation. See p. 162*

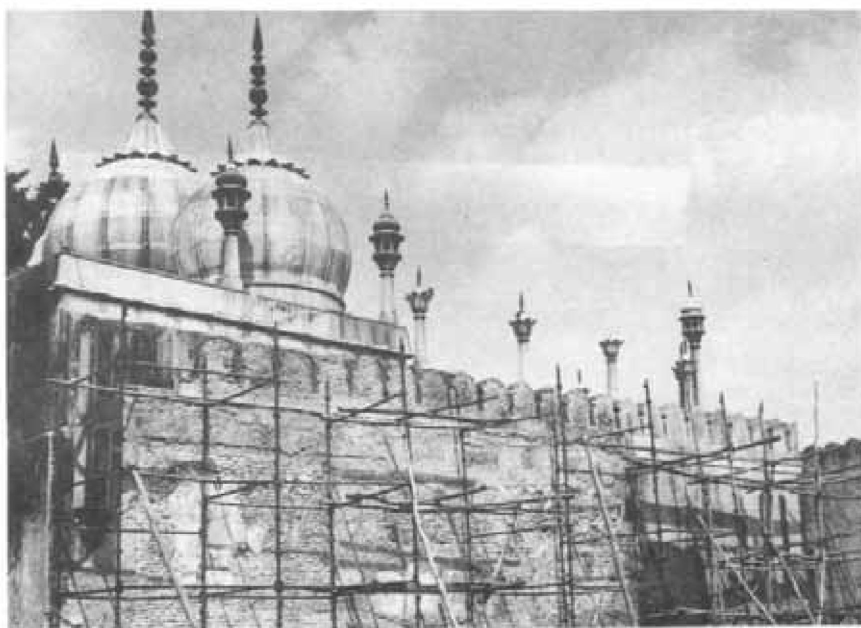


A

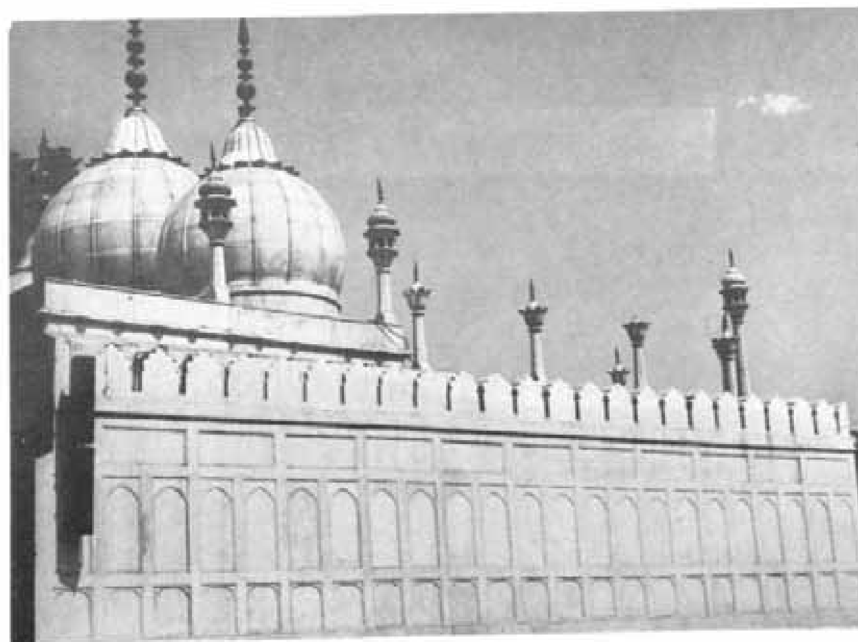


B

Nakodar : Haji Jamal's tomb, A, *during and* B, *after r·pairs.* *See p. 162*



A



B

Delhi : *Moti Masjid*, A, *during and* B, *after repairs. See p. 162*



A



B

Delhi : Madhi Masjid, A, before and B, after conservation of walls and cells. See p. 163



A

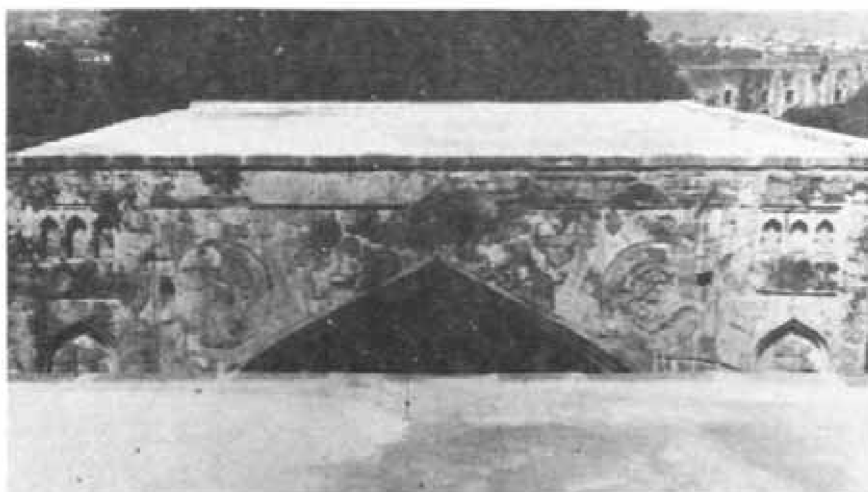


B

Chandragiri : *Raja Mahal*, A, *before and* B, *after restoration of missing balconies.* *See p. 165*



A



B

Hyderabad : Golkonda fort, A, before and B, after repairs of the roof of African Body Guard rooms. *See p. 166*



A



B

Dig : *Savan Bhawan*, A, *during and* B, *after conservation of roof.* *See p. 168*



A



B

Hanumangarh : Bhatner fort, A, *before and* B, *after conservation of bastion.* *See p. 168*

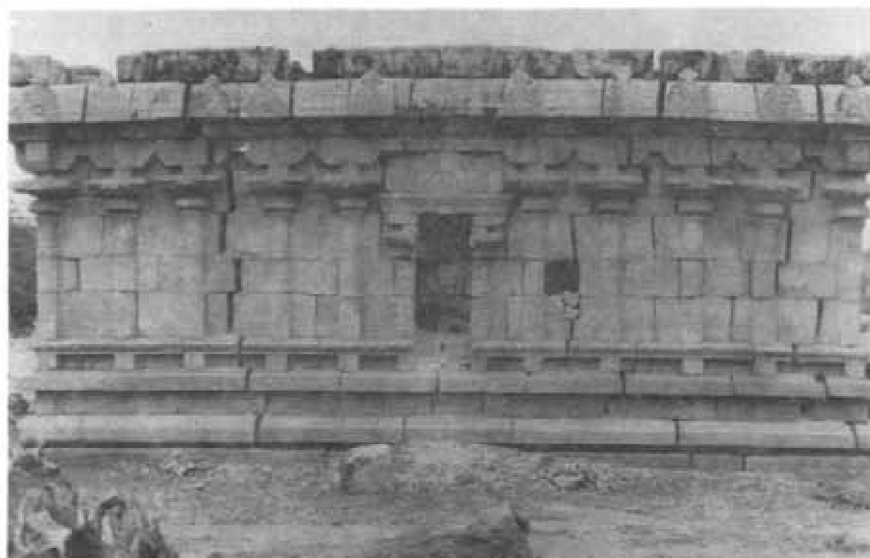


A

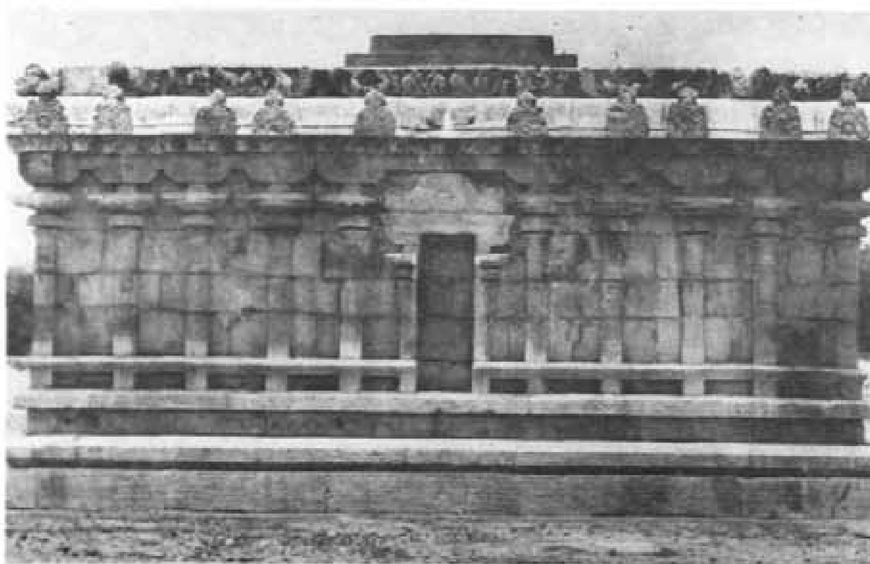


B

Vayalur : *Tirupulisvara temple*, A, *before and* B, *after conservation of Nasantamandapa. See p. 172*



A



B

Suriyur : Tiruvilangudy Siva temple, A, *before and* B, *after conservation. See p. 173*



A



B

Gangaikondacholapuram : Brihadisvara temple, A, before and B, after conservation. *See p. 174*

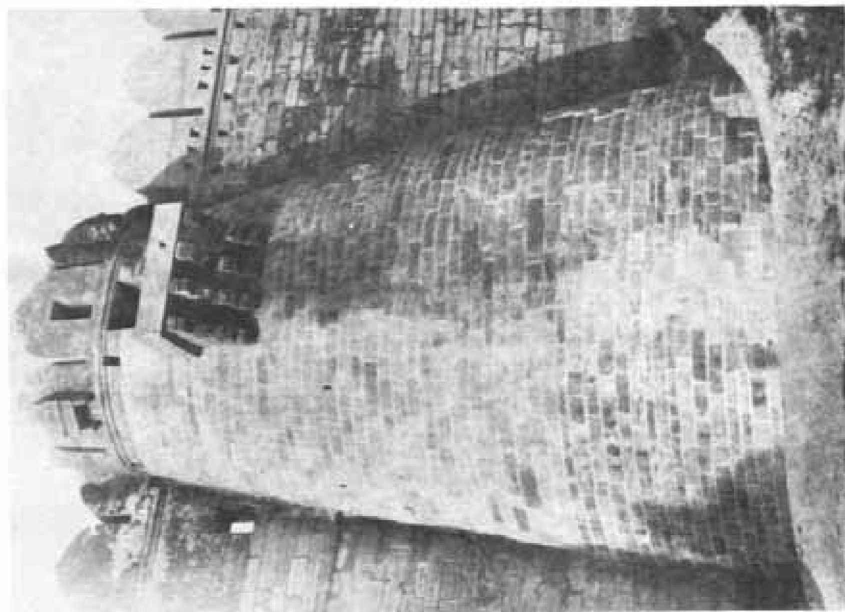


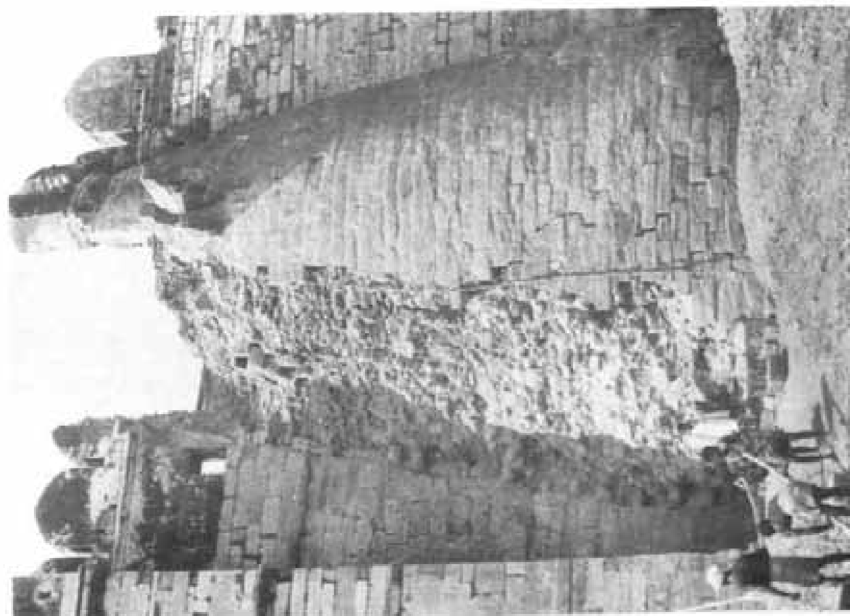
A



B

Tabo : Buddhist Monasteries, A, *before and* B, *after repairs of the plinth of the chortens. See p. 175*





Jaunpur : Fort, A, *before and* B, *after conservation of eastern bastion.* *See p. 176*

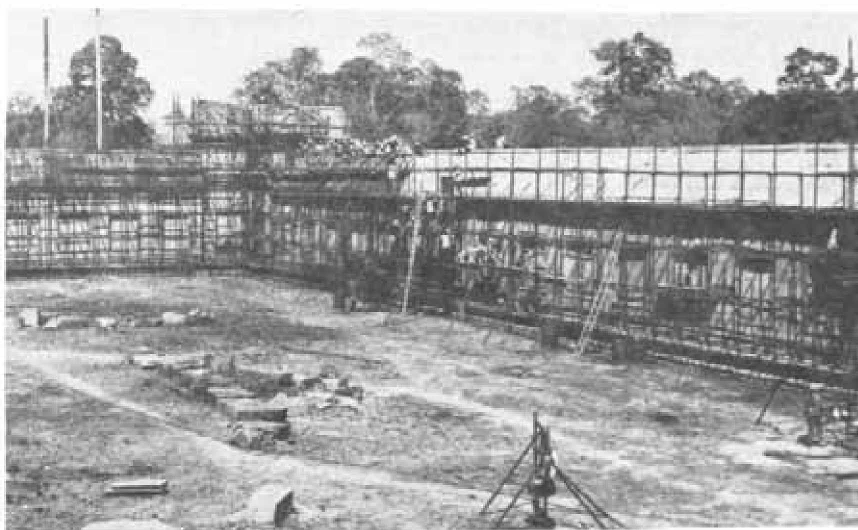


A



B

Siemreap (Cambodia) : Angkorvat, A, before and B, after repairs of Southern Gallery of antichamber between Second and Third Enclosure. *See p. 185*



A



B

Siemreap (Cambodia) : *Angkor Vat,* A, *during and* B, *after chemical treatment of interior corner of Second Enclosure.* *See p. 187*



A



B

Delhi : Red Fort, A, before and B, after chemical treatment of ceiling of Diwan-i-Khas. See p. 190



ARCHAEOLOGICAL SURVEY OF INDIA